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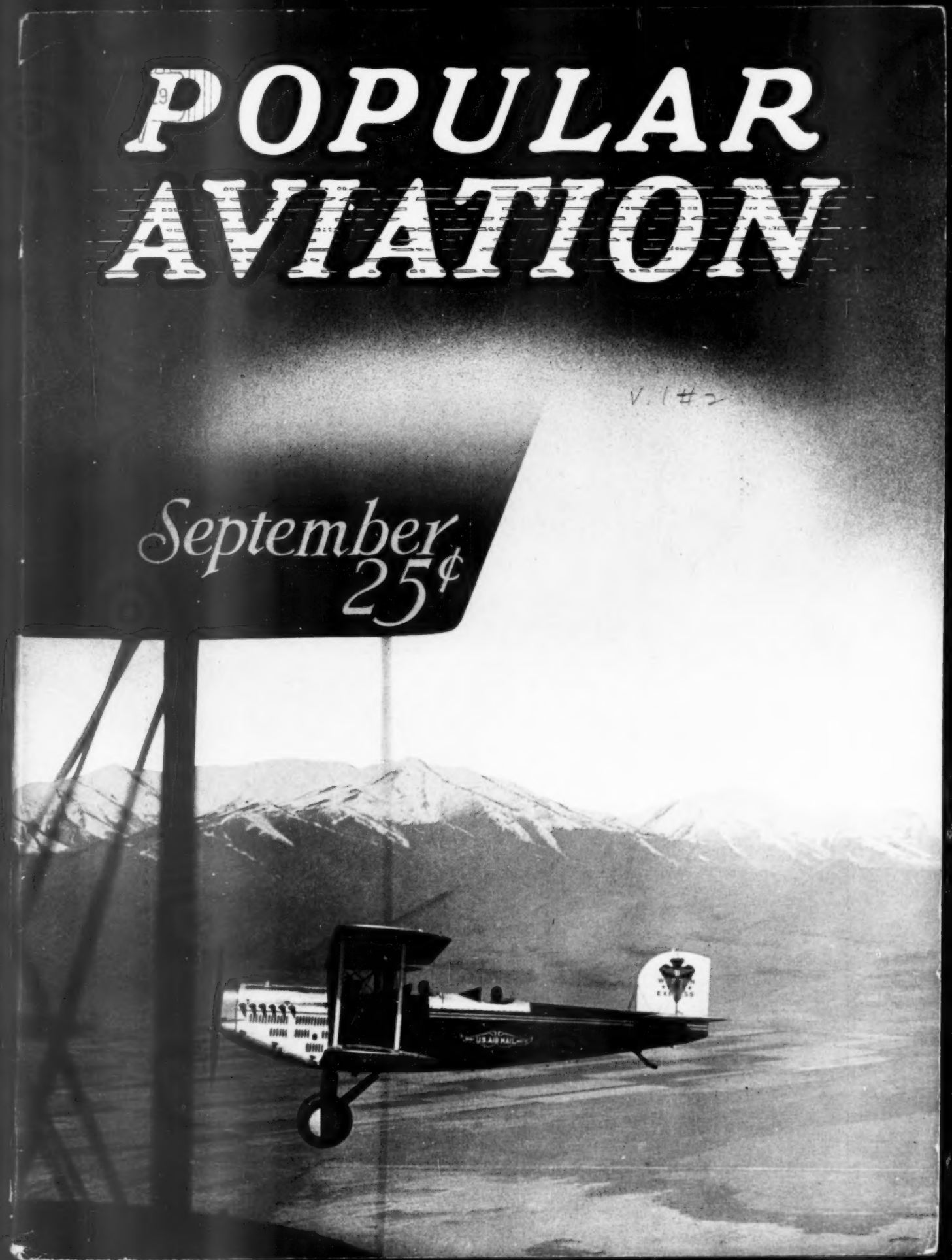

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POPULAR AVIATION

Published Monthly

A magazine for everyone interested in aviation progress and development.

Volume 1 SEPTEMBER, 1927 Number 2

Contents

Flying is Safe 4
Byrd's Atlantic Trip 5
The Second Hawaiian Hop 9
An Epic of the Air 11
The First Channel Air Crossing 13
Flying for Sport 16
The National Air Tour 18
Business Travels by Plane 19
Long Distance Flights 23
New Naval Records 27
The Lindbergh Tour 28
The Vanishing Gypsy 29
The New Chicago-San Francisco Line 31
Current Comment 32
National Playground Miniature Tournament 34
Model Airplane Construction 36
Chicago—The Great Air Port 40
Airport Site Selection 43
Science and Invention 45
Foreign News 48
An A B C of Aviation 56
Questions and Answers 63

Published Monthly by Popular Aviation Publishing Company, 608 S. Dearborn Street, Chicago, Illinois. Edited by Harley W. Mitchell. Advertising Representative: W. B. Ziff Company, Chicago, New York and St. Louis. Subscriptions, $2.50 per year, single copies 25c. All contributions paid for at regular rates.

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Flying is Safe

AIRCRAFT development has reached the stage when it becomes necessary to sell the layman on the safety factor. Impressions based on war conditions and the fact that any flying accident, even one resulting in little damage, is a spectacular piece of news, seem to underly the popular belief regarding air transportation.

Figures recently compiled by the United States Navy prove that for 20,000,000 passenger miles flown there were but nineteen fatalities. One fatality for each million miles flown by the aviator! Can the safety factor of other fast transportation be compared with this?

Bear in mind also that military and naval training is meant to duplicate war conditions, that military and naval machines are built for speed and maneuverability to rival foreign planes. The pilots are taught to carry out all sorts of maneuvers in every kind of weather. This increases the hazards over peacetime, commercial flying by a wide margin.

When we look at the commercial figures of 575,000 miles per passenger for every accident as shown by the statistics of the Russian Airlines, with no fatalities, we must necessarily admit that previous conceptions as to the hazards of flight must be corrected.

There are American air lines that can duplicate these records. The only reason they cannot excel them is because air transport is not yet as popular in this country as abroad. When our air transports are in full operations the figures will astonish the public.

The supervision of the industry, from manufacturer to operator, will, when completely accomplished, make available figures that will offer cold proof.

We cannot avoid, or by tacit agreement overlook, this great safety factor. It is that one thing alone that must be emphasized to the public, and it cannot be so emphasized by a policy of deliberate silence. We must sell this most necessary development of Flying to our friends, associates and prospects. We must do our part to eliminate the eighty per cent of crashes that are caused by carelessness alone.

Byrd's Trans-Atlantic Trip

LONG hours of tedious waiting, then five hours of anxiety as to the ultimate safety of the four men lost in a terrific storm over France, finally ended by the welcome news that Commander Byrd, with his crew consisting of Bert Acosta, Lieut. George O. Noville, and Lieut. Bernt Balchen, had landed on the shores of France and were safe after a trans-Atlantic trip of 43 hours and 21 minutes.

Hundreds of thousands of people had followed the progress of the flight by means of the radio and for an entire evening had been hearing the relayed reports of the distress signals and messages sent out from the great plane "America" as it circled in the fog over France seeking a safe landing place.

Leaving Roosevelt Field early in the morning of June 29, the great tri-motored Fokker monoplane America flew into bad weather less than two hours out of New York. Let the bulletins sent by radio by Lieutenant Noville tell the story:

"7:22 a. m. Passed Cape Cod few miles. Left Cape Cod light at 7:22 New York time. Misty and rainy. All well!"

"8:41 a. m. Half way between Cape Cod and Yarmouth out of sight of land. Weather clearing slightly. Extra cans of gasoline causing trouble with compasses. Hope they will not when they can be thrown overboard."

"6:50 p. m. Dense fog covers all Newfoundland. Getting above it. Have had bad adverse winds. Impossible to navigate. Can hardly see wing tips. Running into another one now."

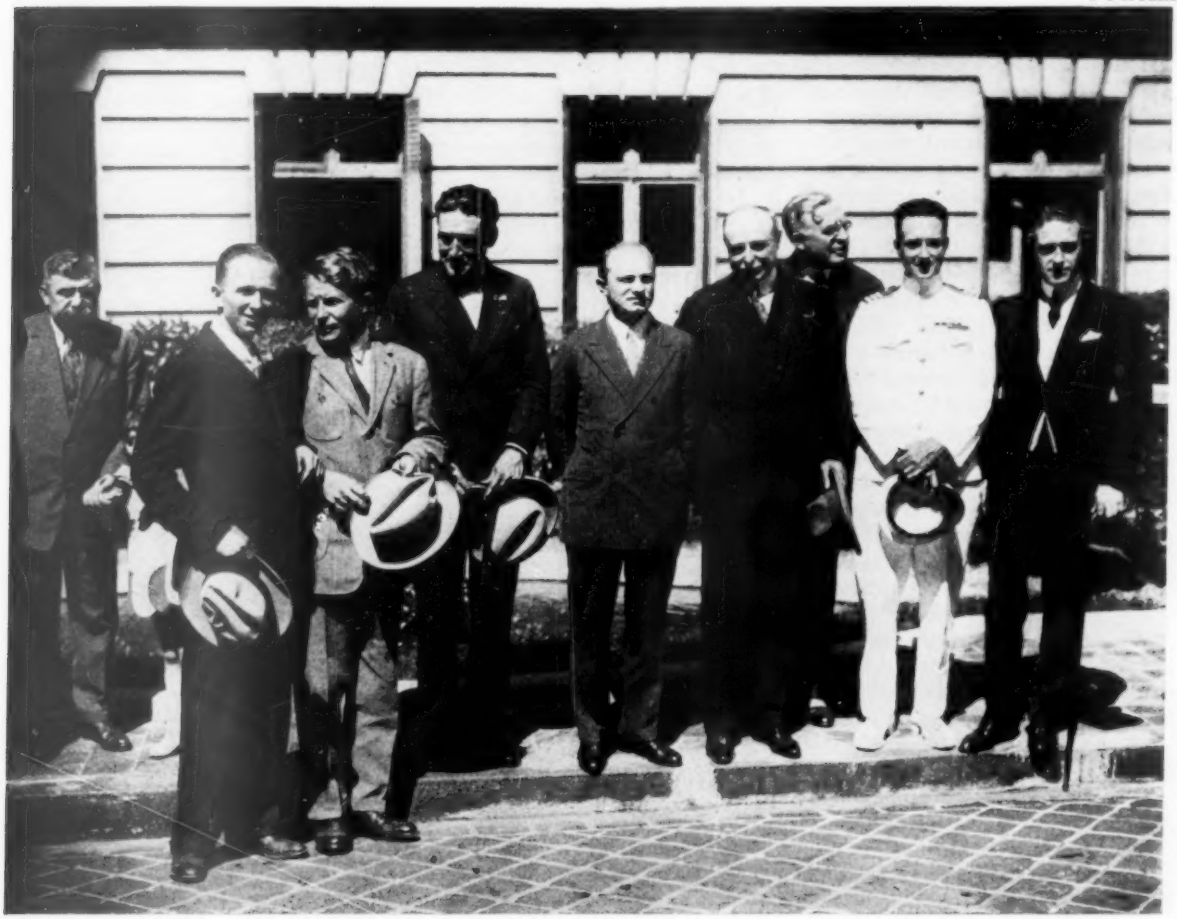
Bad weather closed in on the flyers the moment Nova Scotia was left behind. Acosta and Balchen, taking turns at piloting the America, climbed to an altitude where the clouds would not bother them. Some of the banks of clouds were 3,000 feet high, and for hours the America droned along above the wind and storms of the North Atlantic.

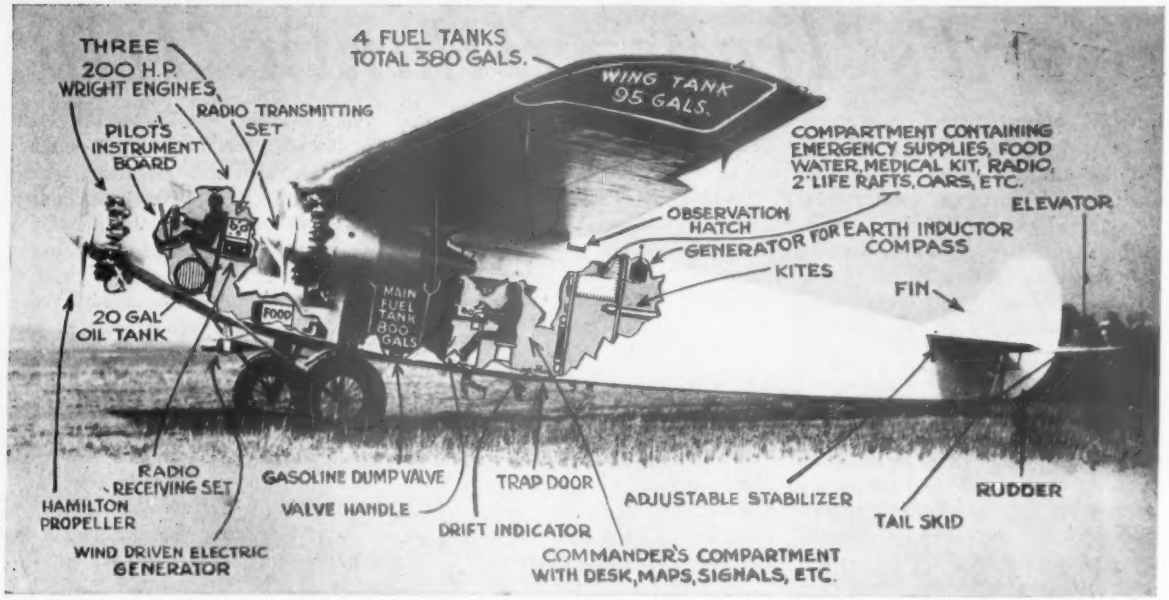
This continued for nearly eighteen hours. Finally Noville caught a message from a liner that the weather at the ocean surface was clear and they descended and had nearly four hundred miles of good weather.

Near Brest the weather had sufficiently cleared for them to see the

An interesting group at the home of Louis Bleriot: Clarence Chamberlin, Lieut. Bernt Balchen, Bert Acosta, Charles Levine, Louis Bleriot, Clifford B. Harmon (President of the International League of Aviators), Commander Richard E. Byrd, Sheldon Whitehouse (American Charge d'Affairs.)

P & A Photo





P & A Photo

Sectional View of the "America" showing in detail the arrangement of the ship.

sunset, but in a short time they ran into fog, wind and heavy rain. It became impossible to see any ground lights.

Meanwhile a huge crowd had gathered at LeBourget Field, just out of Paris. In spite of the weather the field was crowded with people who expected to see the four Americans land. Loud speakers announced the raido messages received from the America by the stations at Brest and Saint Brieuc. Field lights were turned on and searchlights played incessantly in the cloudy sky. At times the clouds were within a few hundred feet of the ground.

The airport authorities calculated that the America would arrive a little after midnight, and as the time approached the loud speakers on the field requested everyone to maintain silence. Rocket after rocket was sent up, the light from them immediately lost in the clouds and rain. The crowd stood silent in the downpour.

At 12:40 a. m. a message came from the flyers: "Flying near. Compass deranged. Indicate position."

A station near LeBourget telephoned that the roar of the America's motors had been heard distinctly. Flares were lighted, more rockets sent up and the searchlights were played about the clouds seeking rifts through which the light might penetrate the sky.

Then came a message, telephoned from the radio station at Havre, "Only three hours' gasoline left." In spite of the efforts made to illuminate the field and to indicate the location of Le Bourget, the flyers had been lost in the fog and rain for hours. According to their stories, they had been unable to make out a single light on the ground.

Balchen was piloting the plane and was finally instructed by Commander Byrd to land on water as soon as they should come to it. Finally they managed to make out the light from a coast lighthouse and suddenly a wind rift revealed the ocean under them. Carbide flares were thrown out and the coast was dimly revealed. Balchen slipped down toward the surface to make the landing as gentle as possible and took off speed.

Oxygen generator for use in "America" should the plane be forced to climb to rarified atmosphere.

P & A Photo

The moment the plane hit the water the landing gear was ripped off. The America went nose under on account of the weight of the motors. Gradually the plane settled in about ten feet of water and the crew took to the rubber boat intended for just such an emergency. Several trips to the shore were made in the boat, rescuing personal belongings, the sack of 200 letters, the first to make an official air trip to Europe, and some of the instruments. Much to Commander Byrd's disappointment some of the scientific data prepared by him on the trip was destroyed.

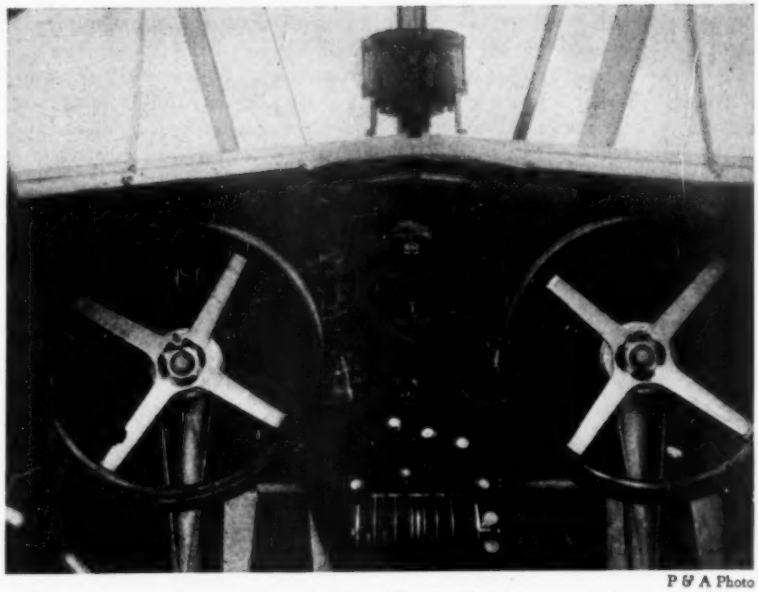
The flyers were safe on shore, but had no idea of their position. Balchen alone was unhurt, the others having suffered minor injuries in the landing. They were near the little village of Ver-sur-Mer, on the coast of Normandy. For an hour they sought for shelter. The inhabitants of the village had heard the motors of the plane, but owing to the storm and the darkness it was some time before the villagers located the men.

Byrd and Noville were taken to the home of the mayor for a little sleep, while Acosta and Balchen rested in the home of the lighthouse keeper. Shortly the world knew, over the radio, that all were safe and that the America had been beached.

Congratulations began to pour in on all four men. Decorations and honors were given them and the round of receptions started. Chamberlin and Levine arrived in Paris almost at the same time and the French capital had an opportunity to honor all of the Atlantic crossers at once.

Sailing for the United States on board the Leviathan after a short stop in England the crew of the America had an opportunity to catch up on the sleep lost during the hectic days of celebration. New York, on their arrival, showed that all of its enthusiasm had not been spent in the welcome accorded Lindbergh a few weeks before.

This great flight stands as a probable long distance record. Of course, no accurate measurement can be made of the distance covered, as the flyers were never sure as to how far into France they were able to fly before the derangement of the compass. If the flyers reached Paris, and it is reasonably certain that at one time they were very close to, if not actually over, that city, and then turned back toward the coast, they covered a little over 3,800 miles, just surpassing the distance of 3,790 miles covered by Chamberlin.



P & A Photo

The cockpit of the "America" with the dual control for the two pilots, throttles and instrument board.

Byrd and his companions were in the air 43 hours and 21 minutes, while Chamberlin had been in the air approximately 42 hours.

The flight was undertaken under the auspices of Rodman Wanamaker, of Philadelphia. It was a demonstration of the strength and stability of the modern airplane and a triumph of navigation over tremendous odds. Marine navigators, faced with such odds, are many times forced to stand off and wait for a clearing of weather before landings can be made. Scientific information as to weather conditions along the route will be of great value to aviation, as there is little available data about fog, wind and cloud conditions in the air over the North Atlantic.

The "America" ashore at Ver-sur-Mer, on the French coast a few hours after landing.

P & A Photo

Commander Richard E. Byrd is only 37 years old, but into that space of time has crammed a life of scientific activity and adventuresome exploration. On his graduation from the naval academy he served at sea, and when the navy went into aviation he joined that branch of the service. He organized the navigation work for the flight of the NC planes across the ocean and in the course of this work invented a sextant for use in aircraft.

In 1923, when MacMillan's expedition to Greenland was organized he was chosen as flight leader. His chief aide was Floyd Bennett, who later accompanied him on the North Pole flight.

On May 9, 1926, Byrd, with Floyd Bennett, took off from King's Bay in a Fokker plane and made the polar flight in 16 hours.

Bert Acosta, one of the pilots of the America, is a well known flyer. His most recent achievement was with Clarence Chamberlin, when they set the world's endurance record of 51

XUM

hours and 11 minutes in the Columbia.

Lieut. Bernt Balchen, the other pilot of the America, has been a test pilot for Anthony Fokker, the designer of the America. He has established an unusual reputation for flying for the year he has been in this country.

Lieut. George O. Noville, flight engineer, is a naval pilot of note. In 1920 he secured a leave of absence from the navy and became superintendent of the United States Air Mail.

This crew is typical of the country —a mixture of races, but all imbued with the pioneering spirit that conquers difficulties and smooths the path for the generations that are to follow. In the words of President Coolidge, in his message of congratulation to Commander Byrd, ". . . I am sure that your present flight will notably advance our knowledge of the conditions which must be met and conquered to make transatlantic aerial navigation commercially practicable and safe."

The prospective flight of Commander Byrd to the South Pole will be another great chapter in the life of this Mercury of Flying.

The region about the South Pole offers difficulties that have baffled explorers for years. Expeditions to the remote wastes that lie to the south have to fight against conditions that are far worse than those prevailing in the Arctic.

Byrd plans to conquer these difficulties and to accomplish his scientific mission by means of two trips. The first, or preliminary expedition, will probably leave early in the fall and return by spring. The following season the great expedition will set forth, prepared to stay a year and a half if necessary.

There is a great difference between explorations at the two Poles. At the North Pole the summer is a season of comparatively few storms, while the Antarctic region is one of sudden and terrific gales. The region immediately around the South Pole is approximately two miles high. This great plateau has made the South Pole more inaccessible than the Arctic.

Commander Byrd names the great Antarctic ice barrier as one of the natural wonders of the world. He gives its dimensions as 400 miles wide, 200 miles deep, towards the pole, and 200 feet thick. Some scientists, including Amundsen, claim it to be a solid mass of ice which rests upon ground.

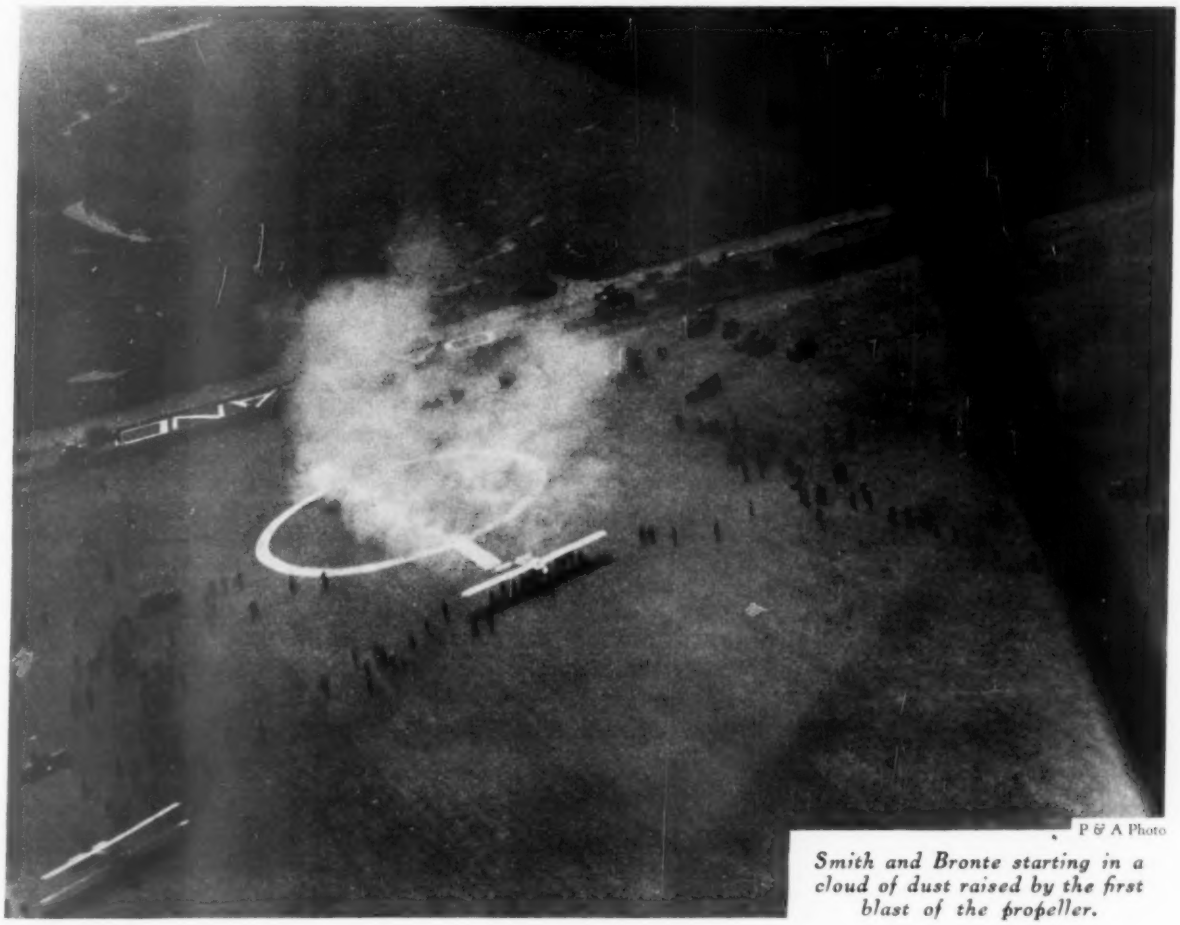
This great ice barrier lies in Ross Sea, south of New Zealand. It was on this barrier that Scott and his companions lost their lives, held prisoners in a small tent, only fifteen miles away from their store of supplies, on account of a violent tempest.

It is planned to take ship to the great barrier in September with a complement of about fifty men, including scientists in different lines, make a base of supplies, and unload the two planes to be used for the preliminary expedition. The great flyer plans on using one tri-motored plane and a smaller, single motored plane for reconnaissance work. On his North Pole expedition Byrd learned a great deal about Arctic flights and the difficulties to be overcome. He believes that the use of a small plane, especially in finding landing places for the larger plane will work will have to be performed in eliminate much of the hazard of flight landing.

It is his purpose to reach the ice barrier in September and put down enough bases, with supplies, so that the following season they can penetrate far into the region. The bases will be located about one hundred miles apart, and a good deal of scout order to locate them at proper intervals with adequate landing places for the planes available.

From these bases the expedition will work out to the right and left, covering territory never before explored. In the words of Richard Byrd, "Our exploration by plane ought to be thrilling, for as soon as we get a few thousand feet in the air we will be able to look down on regions never before seen by a human being, and that is where the explorer gets his big kick."

The "America" at Roosevelt Field, N. Y., before the great flight.



P & A Photo

Smith and Bronte starting in a cloud of dust raised by the first blast of the propeller.

The Second Hawaiian Hop

WITH their radio set keeping them in touch with the mainland at hourly intervals two civilian aviators, Ernest L. Smith and Emory B. Bronte left the Oakland, California, municipal airport at 10:40 on the morning of July 14 and winged out across the Pacific, bound for Honolulu.

Their monoplane, christened "The City of Oakland," carried 370 gallons of gasoline, and weighed, when fully loaded, 4,732 pounds. The plane had been equipped by army flyers with a 600-meter transmitting and a receiving apparatus so that it could receive the beacon signals sent out by the army stations at both San Francisco and in Hawaii.

The beacon signals proved of great help to Maitland and Hegenberger on their flight, but part of the time the receiving set was out of order and it became impossible for them to hear the signals from the radio beacon.

About twelve vessels were bound either to or from San Francisco along the path the flyers were to take to Honolulu, and it was expected that the flyers could keep in touch with them after they were out of range of the land stations.

Reports were received almost every hour from the plane for the first ten hours of flight. No reports of wind conditions were received and flying weather was excellent. Early in the afternoon Bronte sent a message stating that the receiving set was apparently out of commission, but that they were not worried by it.

At 3 o'clock in the afternoon a message came through that no beacon code signals could be heard. There was no way of telling if the failure of the receiving set affected the beacon signals. The receiving set operates on a wave length of 600 meters, while the radio beacon code system used by the army uses a wave length of 1,025 meters.

From reports received from steamers in the path of the flyers, it was calculated that for the first 500 miles they had maintained a rather low cruising speed of approximately 70 miles per hour, a course that air experts declared to be uneconomical from the fuel standpoint.

About 500 miles from San Francisco the flyers could expect the benefit of the trade winds, which have an average strength of 20 miles per hour, for the rest of the journey.

The flight was uneventful during the greater part of the day and night, but when the flyers drew near to the Hawaiian Islands they discovered the fact that the gasoline supply was very low. Tapping the gas tank gave forth

Acme Photo

Wheeler Field, a few miles outside Honolulu, the objective of the Dole Award Flyers.

the resounding sound that indicates to the flyer that very little fuel is left.

Ships nearby were warned through the radio by the flyers that their gasoline supply was running low, and they were asked to stand by for assistance. The radio messages ceased for more than an hour and the people who had followed the flight anxiously over the radio were left in doubt as to the outcome.

Conditions did not prove to be quite as desperate as the first messages indicated. The gasoline reserve was low, but the tank did contain enough gasoline to enable them to reach the land. Early in the morning the flyers reached the leper island of Molokai, and in the absence of a proper spot to land deliberately crashed their plane into a palm tree.

As a work of navigation no possible criticism could be leveled at these two men. They had come within sixty miles of their objective, a really noteworthy attempt in view of the fact that their radio beacon was not functioning properly and for most of the distance the course had to be laid by what is known as "dead reckoning."

Molokai, on the eastern side, is a most inhospitable landing place. The island is rough and mountainous and on that shore does not present the wide sand beaches of many of the Hawaiian group. The flyers' action in slowing down and finally selecting a tree as a landing place speaks well for their grit and determination. They had stuck to the job of navigating their ship until the last drop of fuel had given the last thrust to the propeller.

One naturally regrets the wrecking of the plane in landing, but, after all, the damage done to the craft is trifling in comparison with the accomplishment of the pilot and navigator.

These men have demonstrated that it does not take any elaborate organization to make this flight, and are the first civilian pioneers of the Dole Race which will take place shortly.

Ernest L. Smith, pilot, (left) and Emory Bronte, navigator, standing before their plane "The City of Oakland."

P & A Photo

An Epic of the Air

Champion's Great Feat

We read of men who battle against terrific odds—in fiction—but seldom do we have an opportunity to come across them in real life. Here is an example of devotion to duty in the face of danger that should live.

ONE of the outstanding feats of the air occurred in Washington, D. C., on July 25, when Lieut. Carlton C. Champion, of the United States Navy, made an effort to shatter the altitude record for both balloons and aircaft.

The cool daring and courageous action of this flyer in the face of what seemed certain failure will live a long time in the annals of flight.

Lieutenant Champion took off in a Wright "Apache" plane for the purpose of testing out the latest development of equipment for high altitude work by naval aircraft.

Circling the field in widening spirals he soon climbed to an altitude of 20,000 feet, where he found a wind that would enable him to resume his climb without passing over too much ground and taking him too far from the field. He carried with him two sealed baragraphs which would automatically record the heights reached and would offer official proof in case the previous records were broken. Besides the sealed baragraph an especially accurate test altimeter was mounted on the dashboard. It was by means of this altimeter that Lieutenant Champion judged the height reached.

Lieutenant Champion has made a number of altitude flights and was able to tell from a number of indications that he reached an altitude higher than any he had previously climbed. One of these is the amount of oxygen required for himself in order to maintain comfortable flying.

The flyer had reached a height which was indicated by the altimeter as close to 47,000 feet, nearly 7,000 higher than the previous world's record, which has been held by the French for two years.

His first indication of trouble was a vibration of the entire plane. The severity of this vibration was so great that he found difficulty in controlling the plane, and for several minutes found himself rapidly losing height and flying first upward and then down, with the plane in unusual flying positions.

A good blast of oxygen soon restored the lieutenant to normal and he realized that there was a fire around the engine. He immediately side-slipped and then went into a dive, which blew out the fire, but the extreme vibration of the engine nearly tore the motor from the plane. He shut off the gasoline supply and started to glide for the field, but the fire broke out again almost as soon as the gliding speed was reduced.

He was forced to side-slip and dive again to put out the fire, and perceived that the vibration was worse than ever. The engine being cut off the propeller acted like a windmill and the flyer

could tell by the violent throbbing of the entire craft that some part of the motor mechanism had been torn away. The fear of losing the engine was ever-present, for it was evident that the mounting was becoming weakened by the breaking of parts and he could see the engine sway from side to side.

With the engine gone the craft would be unmanageable, as the center of gravity would then be so far back of the wings that the plane would go down in a tail spin.

The plane continued to vibrate excessively, but flew in normal flying position and Lieutenant Champion believed that if he could retain the motor it would be possible to bring the plane to earth, saving his instruments intact. He was wearing a parachute, but decided to wait until the case seemed hopeless before abandoning the "Apache."

At about 18,000 feet elevation fire again broke out, and he was afraid to dive again owing to the strain on the motor due to the propeller action, so he side-slipped as violently as possible. This kept the fire away from the plane. He side-slipped for several thousand feet and the fire apparently burned itself out.

By this time his manouvering had taken him some distance from the field, so he looked for a place to land. He straightened out the plane to glide to a landing, but the fire broke out again with unusual violence. This time it was evident from the smoke that it was caused by lubricating oil from the broken engine. He was then at about 10,000 feet altitude and decided to try side-slipping again in order to keep the flames away from the wings and fuselage. It seemed impossible to blow the fire out and it became increasingly evident that it would become necessary to abandon ship.

This time the heroic flyer determined to try a trick that in many cases would have snapped the engine right out of the plane. He side-slipped and allowed the nose to drop, which changed the side-slip to a dive. With the speed thus created by the dive he brought the nose up to a vertical position, practically a stall, and then slid into a tail dive.

This manouver resulted in the plane traveling backward at a greatly increased rate of speed and the flames were, of course, blown away from the wings and fuselage. Quick handling of the plane as soon as the fire burned itself out for the last time enabled him to make a practically normal landing at the end of the landing field.

Lieutenant Carlton C. Champion, U.S.N., who battled his way over eight miles to earth.

The lieutenant reported that his inspection of the plane showed that possibly the lubricating system had failed, causing overheating and the "freezing" of one or more pistons in the cylinders. He found that seven of the nine cylinder heads were missing, as well as the pistons and connecting rods. The two remaining cylinder heads were badly cracked and both rods and pistons were missing. The rear end of the engine was badly damaged and many parts were missing.

Unfortunately, one of the sealed baragraphs was completely demolished by the breaking up of the engine. The other was badly shaken up and it was possible that the records were worthless. The examination of the baragraph by the Bureau of Standards showed that the baragraphs recorded a height of approximately 39,000 feet. This was a rough calibration of the height, and the accurate working out may show some greater distance.

Here is a beautifully made-to-order example of the benefit of the type of training given military and naval flyers. As an example of cool-headed control in the face of disaster, with every instinct of self preservation clamoring to abandon ship, this man outmaneuvered fire and a crash, and brought his plane down eight miles to a safe landing.

Chicago Air Exhibit

The National Air Transport Company, in conjunction with the L. Markle Company, recently put on an air exhibit in Chicago which was attended by thousands of visitors. The L. Markle Company is the Chicago agent for the Franklin air-cooled automobile.

A set-up Wright Whirlwind motor was one of the chief features of interest. A duplicate of Lindbergh's instrument board was also shown. The National Air Transport showed one of their new Travel-Air planes.

A huge map, seven by twelve feet, showed the present extent of the air mail and transport lines which cover the country in a network.

Words of Wisdom

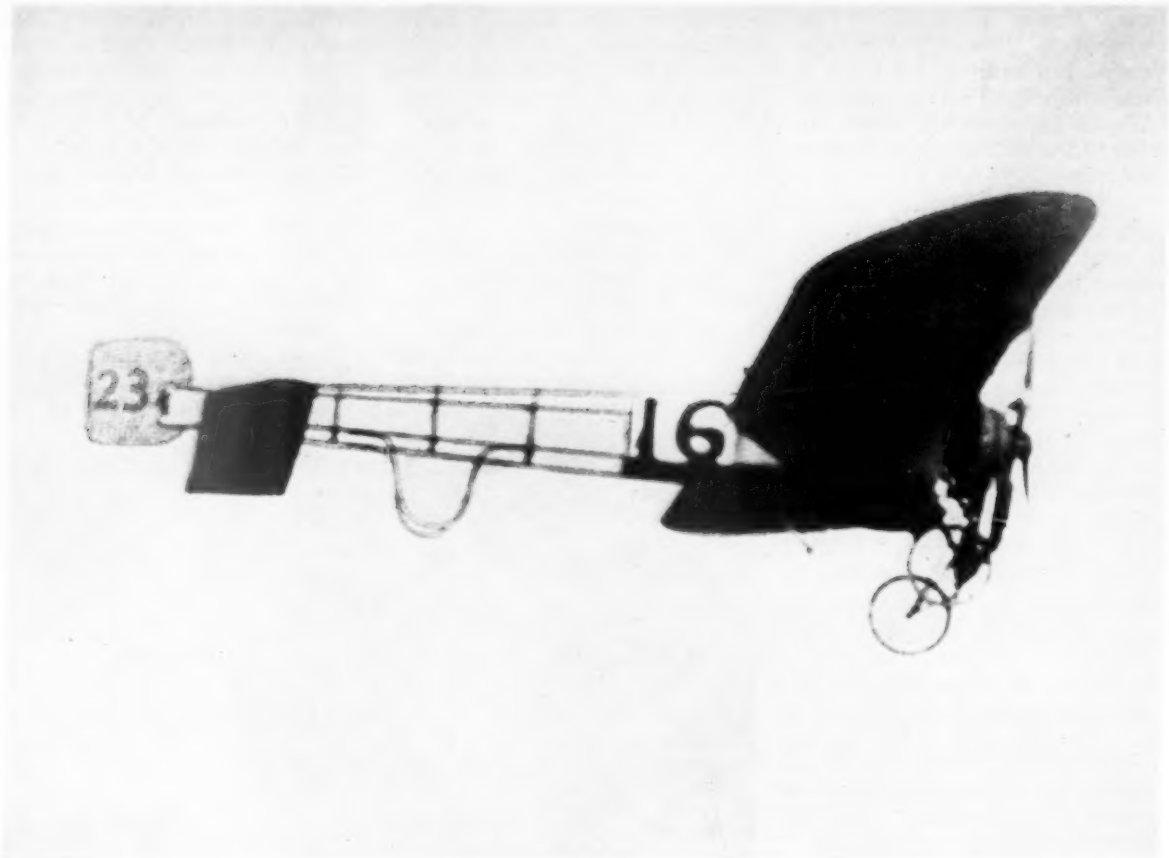
"In ten years travel by air will be safer than any other method of transportation man employs Flying is getting safer. We measure this by the number of accidents for miles flown, and these figures prove the air is not so dangerous. Planes are better, motors are better and men know more about air travel than they did.

"But I want to utter a word of warning. There are three dangers that will do more to hamper aviation than anything else.

"The first is that a great number of flying schools may spring up which will grind out so-called pilots like the diploma mills ground out doctors. It takes time to learn to fly and some persons never can make flyers. I hope this danger will be safeguarded against.

"The second danger is from organization of too many aircraft companies without substantial financial backing. These concerns may spring up and sell stock to the public like the oil fakers.

"The third danger is that smaller communities may get over-enthusiastic and try to build too many airports, which when built would lie idle."—Maj.-Gen. Mason M. Patrick.



Famous Flights of History

The First Channel Air Crossing

One of a series of articles recounting some of the famous flights that have marked man's progress in conquering the air.

TRAVEL by air between London and Paris has become so commonplace that no traveller can expect to create any particular interest by announcing that he has flown the Channel. It is such a regular part of the schedule of several air transport companies that weather conditions practically do not affect the times of departure or arrival. In fact the crossing of the 21 mile Channel is only a small part of the regular trip and is taken as a matter of course.

Business men, tourists and messengers carrying important documents use the air lines today with little thought of anything except the saving of a few hours in time and the avoidance of the discomfort of the notoriously rough Channel crossing.

Certainly the traveller of today sees nothing particularly daring in the flight which at one time was the goal of the aviation pioneer.

In 1909 there had been no flight across open water. The airplanes of the day were imperfect machines that had to be flown with weather conditions nearly perfect. Motors were not especially reliable.

The English Channel, only 21 miles across at the narrowest point, is possibly one of the most important stretches of water in the world. It is England's fence, her wall of protection against the Continent. It marks England's isolation from the rest of Europe. Naturally the spanning of this stormy stretch of water by air would be a feat that had a greater significance than the mere distance would imply. Breaking the geographical isolation of England in a manner that even her great fleet could not prevent was not only news of the first imporance but an object lesson in national defense.

There were no active objections on the part of England to flying the Channel. It was the Daily Mail, the great London newspaper, that offered a prize of a thousand pounds to the first man to accomplish the feat. Hubert Latham, a young Frenchman with English forebears, announced his intention of securing the prize.

Latham had been flying an Antoinette monoplane and had attracted much attention for the skillful and

daring manner in which he maneuvered his plane. The previous year he had given an exhibition of flying at Blackpool during a gale that had gone far to convince people that flying had possibilities despite weather conditions.

In July of 1909, Latham took his plane to Sangatte, near Calais, France, to await a favorable opportunity for making the Channel flight. He had the co-operation of the French government which assigned the torpedo-boat Harpon to follow his flight and to render assistance should it become necessary. The constant rough condition of the Channel rendered a forced landing on the water a probably fatal affair if help were not forthcoming almost immediately.

A week passed before weather conditions satisfied Latham that an attempt would be accompanied by success. At six o'clock on the morning of July 19 the Antoinette taxied down the runway and took to the air off the cliffs. Almost immediately Dover, on the other side of the Channel, was notified by wireless that Latham had made a start and the seaport town was soon filled with people watching the air for the first sight of Latham.

Motor boats and tugs put out from Dover to meet the flyer, and the Harpon left Sangatte to follow Latham. Watchers on the French shore saw the plane plunge into clouds and disappear, then appear again headed for Dover. Then it was lost sight of completely. The waiting crowds soon became aware that a mishap had occurred. Cables and wireless were occupied with messages until it was reported that the Harpon was headed for Calais with Latham on board.

The Antoinette had covered about seven miles, or a third of the distance, at a speed of about 45 miles per hour when engine trouble developed. Engines were not the perfected mechanisms they are today, but Latham had had no reason to believe that his motor would fail him after less than a quarter of an hour of flight. He was forced to make a gliding descent on the water, where the plane floated until picked up by the rescuing gunboat.

Latham immediately left for Paris, after assuring himself that the plane was too badly damaged for immediate repair, with the intention of securing another plane for his next attempt. The former engine was salvaged in good condition.

Meanwhile another aspirant for the honor to be the first man to fly the Channel had appeared. Louis Bleriot, another French pioneer aviator, had arrived at Les Barraques, on the Channel, determined to make an attempt as soon as possible.

Bleriot had attracted considerable attention in France with his tiny monoplane. It was one of the smallest planes that had yet appeared. It weighed but 485 pounds and was powered with a three cylinder 25 horsepower motor. Bleriot had fitted the framework with an air bag as a precaution against sinking should he be forced to make a water landing.

In this machine of his own design Bleriot had made a cross country flight of 25 miles, no mean feat in those early days.

The weather unfortunately remained stormy for several days. Bleriot had burned his foot sometime before and on the morning of July 25th the pain forced him to rise at 2:30 in the morning. He found that the wind had lessened considerably. At dawn conditions had improved to such an extent that he determined to take off immediately.

Mechanics wheeled out the machine and in a few moments all was ready for the flight. The takeoff was without incident, the monoplane soaring over the sand dunes and clearing the telegraph wires along the coast. Bleriot reached a speed of 45 miles per hour and headed directly for the destroyer in the water below him. This destroyer, the Escopette, was to head directly toward Dover, so Bleriot took his bearings from her course and rose to about 250 feet for the flight.

He was able to keep this course for about 10 minutes, by looking back and sighting along the course of the steamer. When he lost sight of the naval craft he was forced to fly straight ahead by dead reckoning. At the end of 10 minutes more he was still out of sight of land.

Underwood & Underwood Photo

Hubert Latham in his Antoinette monoplane, similar to the ones in which he attempted the Channel flight.

This was the anxious period of the flight. Proper compasses had not been developed, there was little data as to drift while in the air, and Bleriot could not be sure as to his direction.

At last he sighted the dim outline of land, and in a few minutes more he discovered that he was heading for Deal, near Margate, east and north of Dover. The strong southwest wind had blown him in an easterly direction from his course.

Changing direction he flew southwest along the coast of England, over the fleet of battleships in Dover Harbor, until he sighted his friend M. Fontaine. Bleriot had arranged for

Fontaine to indicate his landing place by means of a large French tricolor. A stiff eddying wind made landing at the selected spot a difficult feat and Bleriot circled round twice in an endeavor to ease the landing.

Bleriot's machine was slightly damaged in landing and was left in the field under the guard of the solitary policeman who was the only actual witness of the finish of the flight. Crowds soon assembled and it became necessary to obtain other policemen and soldiers to guard the monoplane from souvenir hunters.

Within an hour messages of congratulation began to pour in on Bleriot in his Dover hotel. One of the first was from Hubert Latham, who narrowly missed being the first to make the flight. Latham had given orders that he was to be called at three o'clock that same morning if the wind showed signs of lessening, but he was allowed to sleep until after Bleriot had actually left. There was no wind at the time but before Latham could make ready to hop off the wind had again risen to a point where a flight would be risky and probably again end in failure.

Bleriot became the hero of the hour in England immediately. His tiny monoplane was taken to London and exhibited in Selfridge's department store where thousands of people visited it in the four days it was displayed. Bleriot received the prize of the Daily Mail and also a trophy to commemorate the event—a huge bronze eagle poised for flight on a rocky crag.

Two days after Bleriot's successful flight Latham again made an attempt. After a short trial flight the Antoinette left the French cliffs for Dover and when the wireless message that he had left was received in Dover thousands of people gathered to see the finish of the flight. Bleriot's landing had been practically unobserved but the shores and harbor were crowded this time.

Latham could be seen approaching, but when only a mile from the shore his plane seemed to lose height rapidly. It circled about and finally struck the water less than a mile from the coast. A number of vessels sped to the spot where the plane floated on the water and Latham was rescued, none the worse for his experience except for slight cuts about the face due to the breaking of his glass goggles.

Lindbergh and Bleriot. The trophy is the one Bleriot received for his Channel flight in July, 1919.

Next year, on May 23, 1910, Jaques de Lesseps, son of the Suez Canal engineer, flew from the Channel from Les Barraques, the same starting point that Bleriot used, and made the trip in 37 minutes, landing in a field near South Foreland.

On June 2, following, H. S. Rolls, balloonist and racing car driver, made a round trip over the Channel from Dover. He had a Wright biplane ready for the flight for some days, and about six in the evening he took off and in forty minutes was over France. He circled over Sangatte and in about fifty minutes more was back at the starting point, having traveled fifty miles, most of the distance over water in about an hour and a half.

The reader of today may see little in these flights to cause the stir and enthusiasm invoked by the men who had the courage to attempt them. Remember that flight was a new thing then, that men knew little about air currents and the handling of plane surfaces in the air. Engines were not the powerful motors they are today and stabilizers were unknown. It took intelligent daring for men to attempt to master the secret of flight.

It is said that Bleriot had more than fifty accidents, none of them, fortunately, serious. In 1901 he had become interested in flying and experimented with an ornithopter, a device with wings arranged to flap like those of a bird.

Constant failure with his ornithopter convinced him that he was working along the wrong lines so he applied himself to a systematic study of flight and worked out his scientific and practical knowledge by means of gliders.

In 1906 he built his first ship, a biplane, in collaboration with the Voisin Brothers. It was not long before he became converted to the principle of the monoplane and constructed one that was promptly nicknamed the "Canard" because of its resemblance to a duck. It crashed on trial, but Bleriot kept at his ideas in monoplane construction and in 1907 built one that stayed in the air for several hundred yards. From that time until 1909 he built and wrecked plane after plane until he finally built the one that made the first Channel crossing.

Evanston Air Port

Residents of Evanston, Ill., have revived the idea of filling in a part of Lake Michigan and reclaiming enough land to provide an air field. The action of the citizens, who are asking the aldermen to work out practical plans for this landing field has been hastened by the action of the South Park Board in Chicago in providing a similar landing field on made land off the foot of Roosevelt road.

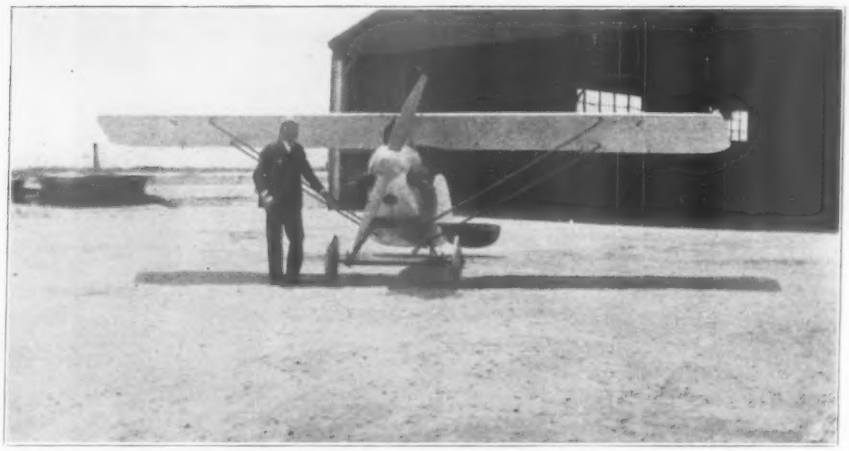
Plane Saves Life

A successful surgical operation on Observer T. Pineo, at Port Arthur, Ontario, has brought to light another heroic episode in the history of Canadian aviation.

Observer Pineo was seized with a serious attack of appendicitis while at the Savanne air base, eighty miles from a settlement. Although flying conditions were extremely dangerous, the entire district being blanketed in a dense fog, while a drizzling rain was falling, Pineo's flying companions, "Duke" Schiller and Mechanic Stull, placed him on a stretcher aboard a hydroplane and brought him to Port Arthur, just in time, the doctors said, to save his life.

XUM

Flying for Sport



By Erwin Baumgarth
Sales Manager, Heath Airplane Company

A few pertinent thoughts on present-day trends in airplane construction and use that will bear mulling over.

Since the recent transatlantic flights the general interest in aviation has been stirred more than ever before. Men who heretofore thought of flying only as a dangerous pastime are beginning to realize that it is not so hazardous after all, and are turning their thoughts to applying the airplane to their own business and recreation.

In the last few years great strides have been made in designing aircraft of greater beauty, utility and economy. For years the public has been fed on big, powerful motors, and as a result there is still a general belief that an airplane to be really practical and useful must be equipped with a large high powered motor, which is very expensive and costly in upkeep.

However, this is not so. Hundreds of planes are being produced today, powered with 90 H. P. motors that are quite inexpensive and simple and economical in maintenance. The Curtiss motor, especially, is so simple that the average amateur flyer can make all his own repairs, but if for any reason he cannot do so, or does not wish to bother with it, he will find mechanics at every flying field who are familiar with this motor.

The cost of operation of this motor is very small, as it consumes only about seven gallons of gas an hour, and as most modern planes travel at the rate of eighty to a hundred miles an hour, it will be seen that the mileage per gallon is equal if not better to most motor cars.

The greatest drawback so far to private ownership is the great distance the flying fields are located from the heart of all big cities. Naturally most privately owned planes would be found in large cities where money is in abundance, but a man cannot be expected to travel more than an hour to a flying field to get his flying for sport or if he desires to make a cross country trip. Downtown flying fields are possible only in few cities. So the logical solution for the city man would be the use of a hydro-airplane or flying boat. Ninety per cent of our big cities are located near water, and the flying boat will enable one to land within walking distance of most any business center.

For those who desire to make frequent cross-country trips the amphibian will serve. This is a type of plane that combines the features of a land plane with those of a seaplane, being able to land on both land and water. With such a ship one may conveniently take off from the waterfront or lakeshore and land with equal ease on the nearby golf links.

Before flying can become really popular one more thing must be given serious consideration, and that is the appointment of the passenger cockpit or cabin, as the case may be. People who wish to go for a joy ride—and ladies especially—cannot be expected to sit in a dirty cockpit, on greasy cushions and among a mass of wires and machinery, such as found in most planes that are used for the customary $3 to $5 trips.

The public today demands refinement, whether they travel by automobile or airplane, and if an aircraft manufacturer desires to cater to airplane prospects he must first of all present a machine that equals the automobile in comfort and elegance. Beauty does not add much to the cost of a plane and surely does not detract from its flying qualities, but it certainly is a necessary adjunct in selling the public.

While the biplane has been favored in this country for many years and has proven an efficient type of plane, it is evident from the most recent creations of the aircraft industry that the monoplane is once more coming into public favor.

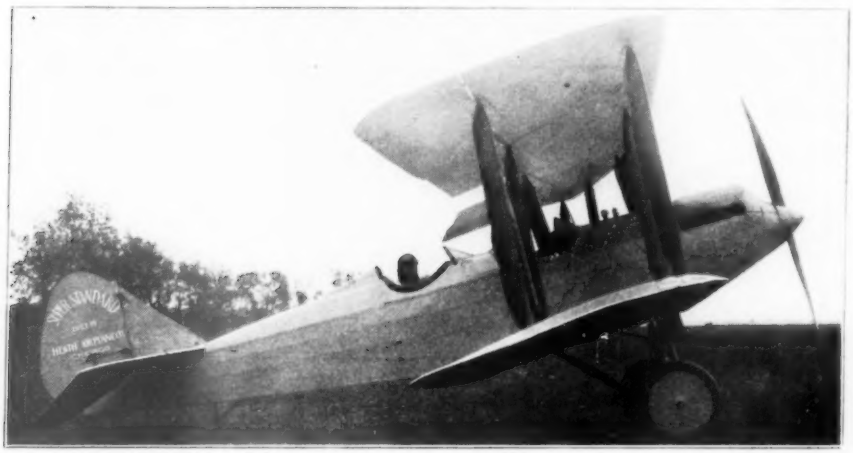
Lindbergh's ship, Byrd's, Maitland's and Chamberlin's ships all were monoplanes. All have surely demonstrated their ability. The monoplane has numerous advantages, but being a new thing it is still rather expensive. One of its advantages is the excellent vision the monoplane wing affords. Then there is the absence of the many struts and wires that hinder in flight and require frequent adjustment. The monoplane also maintains an inherent stability not found in the biplane. It is a type that combines the utmost in beauty with the greatest utility. The plane for the business man—it is safe to say—will be a trim monoplane of about 100 H. P., seating pilot and two passengers in a comfortably upholstered cockpit or closed cabin.

The diminutive little sport plane, powered with a motorcycle or other small engine, also shows a trend towards the monoplane type and will serve the "flaming youth" who wants to fly around the field, showing off to his friends and having a good time in general. The little sport plane is not intended for lengthy trips, but is a great thing for "hopping" around the field just for the sport of it. It is, in comparison with the large ship, like a little speed boat compared with a big cruiser.

Airplanes of today are built like bridges. There is no more guesswork. Everything is figured out to a "T" and only through such efficiency can results like the New York-Paris flight be obtained. Modern technique and modern production methods have made it possible to place the airplane in reach of the general public, and it will not be long until each city has its quota of privately owned airplanes.

Right now there are in the city of Chicago about 150 airplanes, most of which are privately owned, but little is known about them because they are located at fields far out of the city. With no emergency field to land near the downtown district, flyers do not like to risk their ship flying over the city. The result is that few airplanes are seen over Chicago and the general interest in aviation is lacking.

Thus we come back to the point previously brought out, that aviation will become popular as soon as downtown flying fields are established.



One of the Heath Super-Standards built in Chicago's oldest airplane factory.

Although commercial aviation is today safer than motoring, there is still a public opinion that airplanes are dangerous. This may be attributed to the wide newspaper publicity given all airplane accidents, most of which have no connection with commercial aviation whatever.

Unfortunately public sentiment cannot be changed very quickly, but when insurance on planes can be obtained cheaply, the fear will be greatly lessened. People do not only fear for their lives, but fear for their money invested in the airplane, and when their investment can be covered by insurance, this one fear at least is eliminated. Insurance can be obtained today, but the rates are still very high on account of the insurance companies wanting for lack of statistics. Now that the new government regulations are in effect and every plane is registered and kept track of, insurance companies will be able to obtain accurate statistics of airplane accidents, etc., and the rates will soon come down within reach of every plane owner. A few thousands dollars tied up in a plane will then be fairly safe.

Aviation has made as much progress in this country in the last six months as it did during the war and the public is being educated to the fact that airplanes are not meant for military use only. The interest is here and will continue. The aircraft industry has at last secured a sure foothold and the time is not very distant that we will see the commuter drop in from his country home or golf club by air, as he does today by dirty railroads or dusty automobile roads. The air is clean and invigorating. It is something different, something without comparison.

Air Weather Reports

The Weather Bureau hopes to be able, in the very near future, to prepare complete ocean weather charts and dependable forecasts every day. These will be broadcast by radio for the benefit of both air and marine navigators.

During the preparations for the transoceanic flights the weather bureau was enabled to keep the flyers advised as to weather conditions largely on account of the voluntary aid given by shipmasters on the high seas. With the aid of the radio companies these voluntary reports were assembled and transmitted to the weather bureau for charting and analysis.

It is the hope of the Bureau to put this report service on an accurate and absolutely reliable basis, receiving data twice daily from all ships and combining them with reports from land stations in this country, Canada, Greenland, Iceland and Europe. This would make possible the preparation of complete ocean weather charts and dependable forecasts every day.

Radios for Planes

Dr. J. H. Dellinger, head of the radio research laboratory of the U. S. Bureau of Standards, plans an immediate trip to Europe to study foreign methods of radio communications between planes and landing fields.

He will make a tour of England, France, Italy, Switzerland, Holland and Belgium, for the purpose of investigating the methods worked out by these countries for plane communication. Dr. Dellinger is to work out a plan for establishing radio beacons and two-way radio communication on our proposed national airways system.

His trip is the result of the national policy to keep abreast of all developments in this line. Dr. Dellinger is considered the best authority in his line in the United States.

Ocean Going Airplane

Clarence Chamberlin and Charles Levine were guests of the great German aircraft works at Friederichshafen and were shown practically the entire Dornier works, including the new super-plane "Dornier," which is a multi-motored seaplane.

It is claimed that the new Dornier is capable of making 25,000 miles with 25 passengers and six tons of freight. Test flights carrying 60 passengers have already been made.

The American flyers were not shown the model of the contemplated 100-passenger plane which the designers claim will be built within a year. It is the intention of the builders to operate the 100-passenger plane on nonstop transatlantic flights.

XUM

The National Air Tour

Underwood & Underwood Photo

Eddie Stinson seated in the pilot seat of his Wright-engined Stinson Detroiter, which won the National Air Tour.

WITH a comfortable margin on points, Eddie Stinson, in his new Stinson-Detroiter, won the National Air Tour by finishing at Detroit on July 12, 1927.

Randolph G. Page, in a Hamilton Metalplane, held the second place through to the finish, and H. C. Mummert, flying a Mercury, was third.

Thirteen planes left Detroit on June 27 for the 4,000-mile reliability tour. The thirteen contestants who qualified were accompanied by a Navy Ford-Stout plane as a courtesy passenger ship.

The National Reliability Tour is sponsored by Edsel Ford and the trophy awarded is his gift. The qualifications that have to be met are such that the tour is an incentive to the development of commercial aircraft.

The planes entering the tour with the pilots were: Buhl Airsedan, Louis G. Mister; Hamilton Metalplane, Randolph G. Page; Alexander Eaglerock, Paul R. Braniffe; Pitcairn, James Ray; Alexander Eaglerock, Floyd Clevenger; Mercury, H. C. Mummert; Waco, C. W. Meyers; Waco, John P. Wood; Stinson, Leonard S. Flo; Waco, Paul Riddle; Ryan, Frank Hawks; Stinson, Eddie Stinson; Waco, E. W. Cleveland.

The tour itinerary in the order in which the cities were visted was as follows: Buffalo, Geneva, N. Y.; Schenectady, Boston, New York, Philadelphia, Baltimore, Pittsburgh, Cleveland, Kalamazoo, Mich.; Dayton, Ohio; Columbus, Cincinnati, Louisville, Memphis, Pine Bluff, Ark.; Dallas, Oklahoma City, Tulsa, Wichita, Omaha, Moline, Ill.; Hammond, Ind.; Grand Rapids, Mich., and Detroit.

In order to test the reliability of the planes entered in the contest the scoring is on a point system. Loads on all the machines are constant. The minimum load permitted for each machine is a half pound of contest load for each cubic inch of engine displacement. Every plane had to maintain at least 85 per cent of its registered speed on every lap of the tour.

Speed being the only variable factor in the scoring, some of the planes with low merit factors had an opportunity to improve their standing by means of increased speed on the laps.

Walter Beach has won the last two Tours, and winning it this year would have given him permanent possession of the trophy. Unfortunately, he was not entered in the Tour this year.

Planes were allowed to take off at each stop in the exact order and at the same intervals in which they landed, thus preserving the time factor and the race element.

The winning Stinson-Detroiter, both built and piloted by Eddie Stinson, surprised everyone by its phenomenal weight carrying capacity. Stinson carried a load far in excess of the other entrants, which gave him a lead in points that they could not hope to overcome.

The winning plane embodies several new ideas in design and will be further developed by Mr. Stinson.

Hamilton Metalplane which won second place in the National Air Tour.

The "Stanolind" in flight, just after taking off at Lansing Airport, Lansing, Ill.

Business Travels by Plane

This is not a lone example of "Business" taking to the air. In later numbers of Popular Aviation we will tell the story of other business concerns that have discovered this new Transportation.

THE giant all-metal airplane, Stanolind, with a maximum speed of 110 miles per hour, and a capacity for eight passengers not including the two pilots, was completed and delivered to the Standard Oil Company (Indiana) on May 21, 1927. The initial trip was made on that day, when officials of the company flew from Detroit to Chicago. The plane was built by the Stout Metal Aircraft Division of the Ford Motor Company at Dearborn, Mich. Its length is 49 feet, span 71 feet, height 13 feet. The area of wings is 740 square feet and has a wheel tread of 15 feet. In spite of its enormous size, the airplane weighs only 5,200 pounds, empty, which is not more than a large sedan type automobile, and is capable of carrying 4,000 pounds, including fuel, oil and baggage. It has a gasoline capacity of 230 gallons.

The plane was purchased so that safe, fast and comfortable trips could be made to oil producing regions, division headquarters and outlying refineries.

The plane is equipped with three air-cooled motors, and will fly, fully loaded, on any two of them. In this manner the element of danger from forced landings has been practically eliminated. The three motors consume approximately 45 gallons of gasoline and three gallons of lubricating oil per hour during flight and it carries sufficient fuel for a five-hour flight without landing.

The ship's cabin, which has all the modern conveniences, is 7 feet high, 15 feet long, 4½ feet wide, and the interior is divided into five separate compartments. The forward compartment is the control cabin, the upper part of which is entirely enclosed in glass. It is entered through a door from the main cabin in the rear and contains seats for the two pilots, together with a complete double set of controls, so that either pilot can operate the plane at any time.

XUM

In front of the pilot seat is mounted the control board on which are located the navigating instruments. These include instruments for determining direction of flight both vertical and horizontal, speed through the air, speed of each engine, temperature and pressure of the oil, etc. The throttle and ignition controls are mounted on a panel at the center of the instrument board where they are immediately accessible to either pilot.

Behind the control cabin and just ahead of the wing, is located a small observation compartment equipped with windows in the upper half through which an excellent view may be had in all directions. The space under the seats may be used for storage.

The main cabin is located immediately beneath the large wing which provides a welcomed shade for the observation windows on bright days. This cabin is fitted with a writing desk and four large wicker chairs which can be moved around to any convenient place. Smoking sets and electric cigar lighters are provided in convenient locations. Mounted in the front wall of this cabin, in plain sight of the passengers, is an air speed indicator and an altimeter which shows the speed and height at which the airplane is flying.

The after cabin is equipped with three berths which may be made into comfortable beds at night or converted into roomy divans during the day. The walls of all of the cabins are padded with kapok to render them noise proof and make it possible to carry on a conversation in spite of the noise of the engines. Large observation windows which may be opened or closed for ventilation, are located in the cabin walls. Behind the after cabin is a completely equipped washroom, toilet and a space for baggage.

It is not necessary for either pilots or passengers to wear helmets, leather coats or any special clothing. The cabins are provided with an exhaust heater so that they may be kept at any desired temperature even in the coldest weather. Passengers may move around and walk back and forth from one end of the ship to the other during flight. There is less vibration and jar than is apparent in a modern parlor car and passengers may read, play cards or sleep on these flying trips.

The airplane itself is of the type known as a three-motor monoplane or single-wing machine and is constructed entirely of metal. The metal used is duralumin, a copper-aluminum alloy. It is as strong as structural steel, but weighs only one-third as much. The big wing is built upon trusses exactly like those used in the construction of a bridge, while the fuselage or passenger compartment is suspended from the

Underwood & Underwood Photo

Chicago delegates to national conference for development of commercial aviation flew to St. Louis in the "Stanolind." Left to right, C. W. Chesters, G. M. Osborn, W. A. Jones, J. T. Porter, C. H. Wagner, E. S. Buckmaster, Roy Ireland, Thos. Wolfe, Jr., and P. H. Cummings.

center of the wing surface, very much in the manner of the body of a large bird. One of the engines is mounted in the forward end of the fuselage. The other two are suspended from the wings. The use of three engines, two of which will fly the plane, is the first fundamental of safety by the elimination of forced landings. Each engine develops 200 horsepower and the complete plane with its 600 horsepower of engines weighs but little more than a large enclosed automobile, yet twenty tons of sand can be balanced on the wings as a test loading without breaking them down.

The engines are of the radial air-cooled type, having nine cylinders each. The cylinders are arranged around the crankcase like the spokes of a wheel, all of the connecting rods being connected to a single throw crankshaft which carries the propeller. Each engine is fitted with an inertia type starter which consists of a small geared fly-wheel, which can be revolved at high speed by means of a hand crank, after which by means of a clutch, the rapidly revolving fly-wheel is engaged through gearing with the crankshaft of the motor so as to turn it over for a few revolutions. Each engine is provided with two magnetos and there are two spark plugs in each cylinder to prevent any failure of the ignition. The engines are all operated from the control cabin of the airplane and can be operated independently of each other or in unison as the case may require.

Interior view of "Stanolind" showing three of the berths. Door at rear is to the washroom.

The landing gear on which the airplane rests when it is on the ground, consists of two wheels with a tread of 15 feet. Forty by 10-inch tires are used to carry the weight of the airplane and make it roll easily over rough ground. Each wheel is equipped with an independent hydraulic brake which can be applied by a lever in the control cabin so that the plane can be slowed up on landing or, by operating one brake at a time, can be made to turn in a very small circle. The landing gear is fitted with rubber springs and an oil-filled hydraulic cylinder which absorbs the shock when the airplane strikes the ground at high speed.

Looking forward in the "Stanolind" towards the pilots cabin. The controls can be seen.

Before being turned over to the Standard Oil Company (Indiana) the airplane was inspected by the United States Department of Commerce, was certified to as being airworthy, and the United States Government license issued under the number which is painted on the wing and rudder of the plane. The license number serves exactly the same purpose as the license number on an automobile.

The two pilots, John P. Porter and Perry G. Hutton, are constantly on duty with the plane. Both men are experienced flyers and have passed the Government requirements for transport pilot's licenses. Either man can handle the airplane alone or one may navigate the plane while the other controls the motors. In flight the airplane is navigated very much the same as a ship on the ocean, that is, the pilots set a course by compass making the necessary allowances for drift due to side or head winds and keeping the ship at an altitude which allows them a distinct view of the surrounding country with ample opportunity to

pick out a safe landing field in case of trouble.

For night flying the plane carries the standard red and green navigating lights and also a pair of search lights, located under the wing tips which may be turned on when approaching the

Underwood & Underwood Photo

Cranking one of the wing motors on the Standard Oil Ford-Stout plane the "Stanolind."

land. Electric lights operated by a storage battery are provided in all the cabins.

Colonel Robert W. Stewart, Chairman of the Board of Directors of the company, who is interested in aviation and has had a great deal of experience in flying, in commenting upon the purchase of the airplane said, "This airplane has been purchased primarily to furnish safe, fast and comfortable transportation when making long distance inspection trips to oil producing regions, division headquarters or outlying refineries. Since the airplane flies in a straight line at a speed of approximately three times that of the fastest express train the saving of time more than compensates for the expense of operation and makes the airplane an economical method of travel. Since the airplane is equipped with three motors, and will fly fully loaded on any two of them, the element of danger from forced landings has been practically eliminated and travel by air is now as safe and comfortable as traveling on a transcontinental train. The Standard Oil Company (Indiana) is also very much interested in the encouragement of commercial aviation, since we believe this to be one of the coming forms of transportation in this country. The company has already outlined and put into effect an immense program of marking airway designations on the roofs of its warehouses in order to aid flyers in navigating over unknown territories."

The advertising of the Standard Oil Company is now emphasizing air transport and the future of this great industry.

Woman Operates Airdrome

It is believed that Mrs. Lorenza Oelze is the only woman in the country engaged in operating a commercial flying field. The flying field which is run by Mrs. Oelze is located at Los

Angeles, Cal. Her husband, Carl Oelze, who died recently, was a former naval aviator. The photograph shows Mrs. Oelze, in her flying costume, entering one of her planes.

Double Aerial Wedding

A double aerial wedding was solemnized July 5 when Hermann Rahskopf and Edward Vogt, both connected with the Rohrbach airplane works, with their brides, a minister and witness, circled above the Kaiser Wilhelm Memorial church. A phonograph furnished appropriate music, whereupon the marriage service was read and the vows exchanged.

Berlin's "flying sky pilot," Rev. Herbert Teichmann, who officiated at the double wedding in an airplane, has been suspended from office by the Evangelical church consistory, which rejects aerial marriages on the score that they are a degradation of a serious religious ceremony.

Criticism of Rev. Mr. Teichmann is not confined to church circles, as the newspapers generally condemn the innovation, which one writer declares "exposed the word of God to the roar of propellers" and brought the church into competition with mundane sports.

Plane Hunts Official

An airplane was used over Kendall county, Illinois, in a search for E. D. Thomas, thistle commissioner of the county, missing from his home in Plano. He was last seen in his automobile. Searching parties on foot and in machines had been unable to find trace of Thomas, so Dr. H. J. Neubar of Hinckley and Louis Steward of Plano, air pilots, volunteered to search by airplane.

Flies for Sport

When Thomas D. Stimson, business man of Seattle, Wash., deserted his friends on the golf course they investigated and found that he had taken up flying for sport.

Mr. Stimson learned to fly several years ago and holds a pilot's license from the Aero Club of America. He flies a 90 horsepower Waco plane, and says that as a recreation flying is far ahead of anything else he has ever tried.

Long Distance Flights

THE official list of entries for the first trans-oceanic air race ever held closed with fourteen official and four unofficial entries. The committee in charge of the entries announced that they would accept other entries that showed postmarks previous to the closing date of August 3.

The race across the Pacific from the mainland to Honolulu has attracted the attention of many aviators and is due to the offer of James D. Dole, pineapple king of Hawaii, to reward the first and second aviators who make a successful trip to Honolulu with prizes aggregating $35,000.

The region around San Francisco Bay will be the starting point for most of the flyers. Major C. O. Osborne, Canadian entry, has announced that he intends to make his flight from Vancouver, British Columbia. Those who start from the airports near San Francisco will have nearly a hundred mile saving over those taking off from any other port. The ports at San Francisco are Mills Field, the San Francisco port, or Bayfarm Island, the Oakland port.

The present entries are:

Arthur C. Goebel, Santa Monica, Cal.

John Augie Pedlar, Miss Mildred Doran, Flint, Mich., with Manley R. Lawing, navigator.

Major Livingston Irving, Berkeley, Cal.

F. A. Giles, Detroit.

C. W. Parkhurst, Lomax, Ill.

Lt. N. A. Goddard, U.S.N., San Diego, Cal., with Lt. K. C. Hawkins, navigator.

Arthur V. Clark, Los Angeles, Cal., with Leland A. Bryant, navigator.

John W. Frost, San Francisco, with Gordon Scott, navigator.

Bennett Griffin, Bartlesville, Okla., with Al Henley, navigator.

Robert Fowler, San Francisco.

Capt. J. L. Giffin, Long Beach, Cal., with Theodore Lundgren, navigator.

Capt. Wm. P. Erwin, Dallas, Texas, Mrs. Erwin, navigator.

W. R. Garrett, Los Angeles.

George D. Covell, San Diego.

The unofficial entries are:

Artin Jensen, Honolulu.

Robert Horsley, Sarasota, Fla.

Clair Vance, San Francisco.

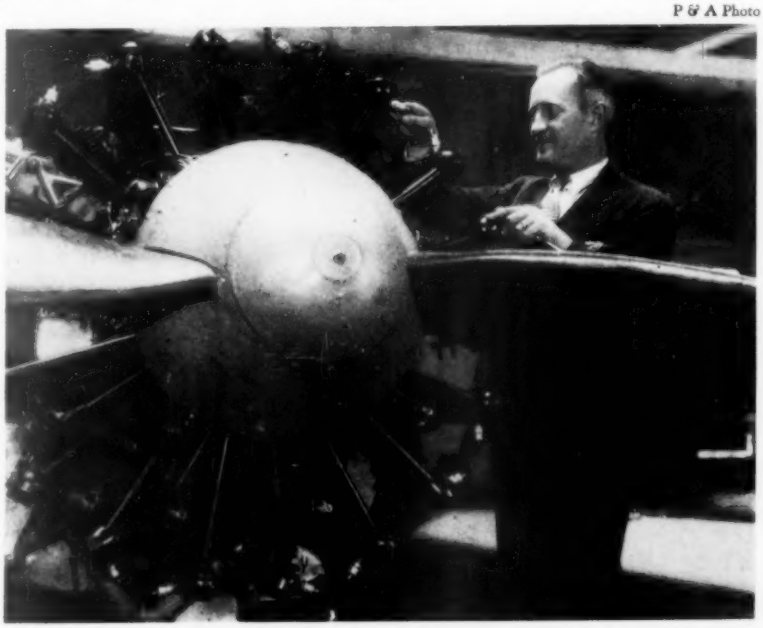
Maj. C. O. Osborne, Vancouver, B. C.

On August 8 the contestants have to appear before the committee and present their credentials and have their planes inspected by the federal aircraft inspectors. Each pilot must hold a certificate from the Federation Aeronautique Internationale.

The rules for the Mainland-Honolulu Flight for the Dole prize of $25,000 provide that all entrants, or representatives, must be on hand to draw lots for positions in the starting line before noon, August 8. The flight is to begin August 12, and starters must hop off within one minute of the signal or be sent to the end of the starting line.

Ernest L. Smith looking over the Wright Whirlwind motor installed in his plane "The City of Oakland."

P & A Photo



Detroit-New Zealand

Frederick A. Giles, Australian aviator, has announced that he intends to fly a Hess Bluebird plane, with a Wright Whirlwind motor, from Detroit to Wellington, New Zealand.

He expects to leave Detroit in time to make the trip to San Francisco and enter the Dole race to Honolulu. The five stages of the contemplated flight are as follows:

Detroit to San Francisco, 2,100 miles.

San Francisco to Honolulu, 2,423 miles.

Honolulu to Brisbane, Australia, 4,709 miles.

Brisbane to Sydney, New South Wales, 500 miles.

Sydney to Wellington, New Zealand, 1,369 miles.

The longest leg of the flight, that from Honolulu to Brisbane, 4,709, will be the longest nonstop flight yet attempted.

The flight is financed by W. H. Rosewarne, a Detroit contractor, who is an Australian by birth. He is backing the flight purely as a sporting proposition. Giles is 29 years old, an Englishman by birth, and has had 2,300 hours of

flying experience. He was formerly in the Royal Navy air service, and until recently was a pilot on the Sydney-Adelaide (Australia) air mail.

Georgia-Brazil Flight

Paul R. Redfern plans to make the 4,300-mile hop between Brunswick, Ga., and Rio de Janeiro, Brazil, some time in August. His plane, which will be christened "The Port of Brunswick," is a Stinson-Detroiter monoplane, and is being built at the Stinson factory in Detroit.

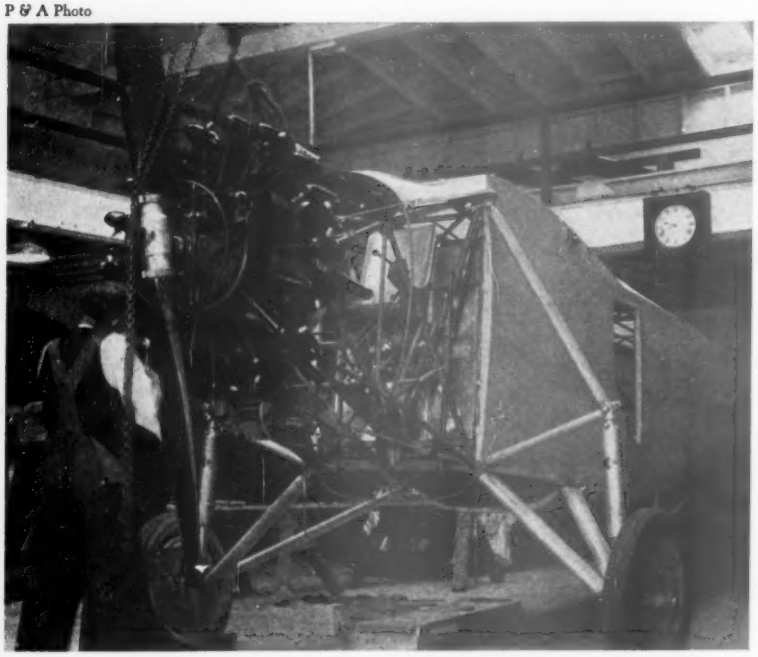
Trans-Pacific Flight

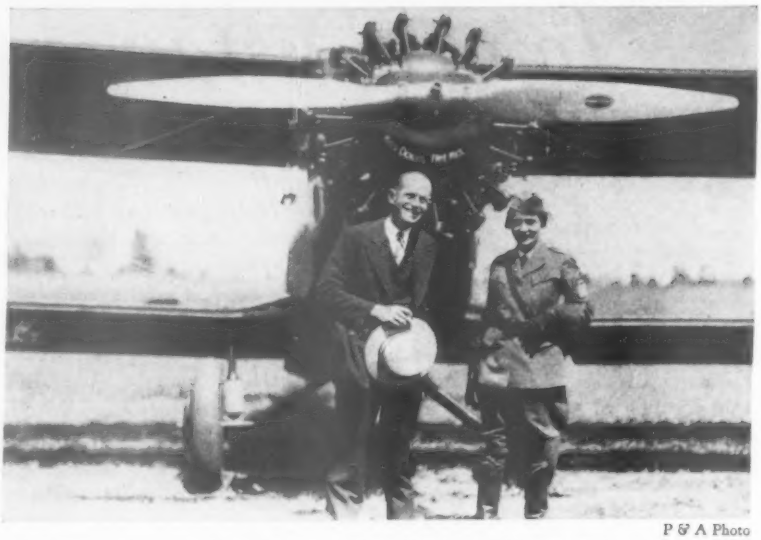
Maj. Livingston G. Irving, of Berkeley, Cal., is planning to compete for the Dole prize in a Breese monoplane, built for him by the Breese Aircraft Company, of San Francisco. The monoplane will have a total gasoline capacity of 350 gallons, which is estimated to be sufficient fuel for the Wright Whirlwind motor for a total flying distance of 3,500 miles. The tank to give the increased gasoline capacity is mounted aft of the control cockpit, a departure from the usual custom of placing it forward so that the pilot does not have to sit between the tank and the engine.

Major Irving is a member of the Lafayette Escadrille. The photograph is exceptionally interesting, as it shows a skeletonized view of the controls and the forward part of the plane.

Plane to be used by Major Livingston G. Irving, Berkeley, Cal., nearing completion in plant of Breese Aircraft Co., San Francisco.

P & A Photo





P & A Photo

Pilot Augie Pedlar and Miss Mildred Doran in front of their plane in which they expect to fly to Honolulu.

Three German Contenders

Three Junkers planes, equipped with Junkers 25 water-cooled motors are almost ready for a transatlantic flight. It is understood that the planes are to be bought and trips financed by groups of business men of Bremen, Berlin and other German cities.

Officials of the Junkers Company have refused to divulge any information about the pilots who will fly the planes, but it is understood that three Junkers pilots, Schnaeble, Loose and Zimmermann, are the outstanding candidates. These men have all had extended experience in both long distance and endurance flights.

The Junkers Company has announced that negotiations are incomplete, but that it is probable that at least one plane will start for the United States.

Brussels-Congo Flight

Two Belgian aviators are planning a non-stop distance flight from Brussels to Leopoldville in the Belgian Congo, Africa. The flight is over 4,000 miles and will take place sometime in September. The two airmen are Flight Lieutenants George Medaets, pilot, and Jean Verhaegen, navigator.

The route planned is by way of Toulon, over the Mediterranean to Bizert, a city in Tunis, over the Sahara desert to Lake Tschad on the border of Nigeria and from there to Leopoldville. It is expected that the flight will take about 36 hours and the navigator, Lieut. Verhaegen, has planned it so

XUM

that the night flying will be over the desert.

On the return trip, which will be by way of Egypt, the men expect to make a stop at Cairo, flying from that point to Brussels, for a total of over 8,750 miles.

15 Day World Flight

When taxed by the newspapers with planning to encircle the globe in fifteen days, thus cutting in half the world's record for that flight, William Mara, secretary of the Stinson Aircraft Company, admitted that a group of Detroit men were seriously contemplating the attempt.

Edward Schlee, one of the backers of the proposed flight, stated that the intention was to use one of the new model Stinson monoplanes—the same design which won the National Air Tour with such a large margin of points.

Prague to Japan

The Czechoslovakian minister of national defense has signed a permit for a flight from Prague to Japan in one of the country's military planes. Colonel Skala, of the Czechoslovakian Air Corps, is making preparations for the flight which is expected to take place this month.

The flight will be made in a regular military plane with a single 450 horsepower motor, but changes will be made so as to allow the carrying of additional fuel and oil.

Rome to Brazil

Late in November a nonstop flight from Rome to Brazil will be attempted by an Italian plane, piloted by Italian airmen. Preparations for the flight have been made in great secrecy but it is known that the plane will have three motors, developing a total of 1,200 horsepower. It has been announced that the ship will be named "Dux" in honor of Mussolini.

The Italian Chamber of Commerce of San Paolo, Brail, has offered a generous prize for the first all-Italian plane to make a non-stop flight from Italy to Brazil. The trip as scheduled is over 4,000 miles long and will take a little less than 40 hours of flight. The route as laid out starts from the Ciampiano Airdrome, near Rome, and goes over Sardinia, Gibraltar, Casablanca, Morocco, Porto Praya, the Cape Verde Islands, Fernando do Noronha island (off the coast of Brazil) and ends at Pernambuco, Brazil. The start will be made in the early morning hours at Rome, and the arrival should be expected in the late afternoon of the second day.

Prague to New York

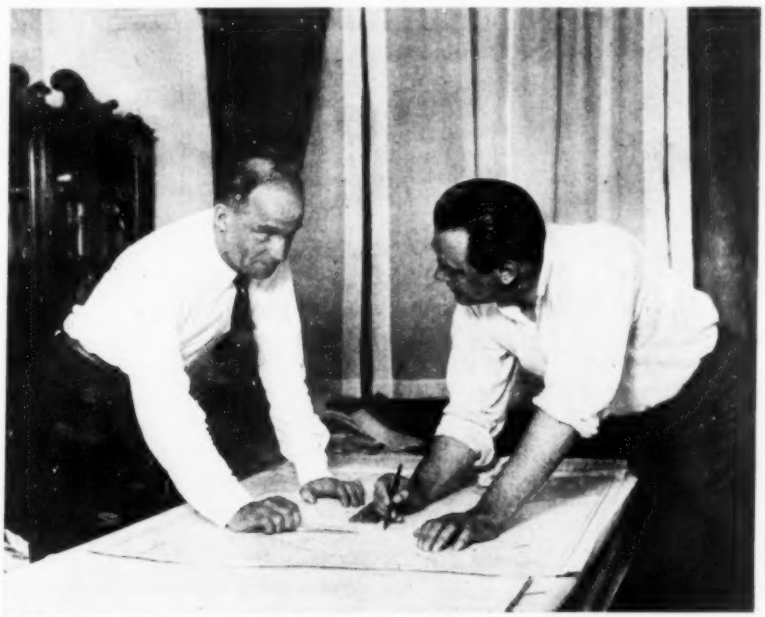
A financial backer has been found for the two Czechoslovakian aviators who have been planning to make a flight from Prague to New York. Two military aviators, Malkovski and Pavlikovski, have been seeking support for some time for their project. They were without success until a short time ago when a backer was found who was willing to advance the sum of $45,000 provided the plane bore his name.

Japanese Offers Prize

Kumejiro Taki, a wealthy Kobe business man and member of the Japanese parliament, has offered a prize of $50,000 for the first Japanese aviator to fly across the Pacific.

Bertaud Plans Flight

Some time this month Lloyd W. Bertaud plans to pilot a Fokker monoplane, already named "Old Glory" from New York to Rome. The plane is under construction at the Fokker factory at Hasbrouck Heights, New Jersey, and will be ready for delivery within a week or so. It will have one 495 horsepower Jupiter engine, a wing spread of 64 feet and wing surface of 630 square feet. It will carry 1,170 gallons of gasoline and will weigh about 12,000 pounds when fully loaded. The trip is sponsored by William R. Hearst.



P & A Photo

Lloyd Bertaud (left) and James DeWitt Hill, air mail pilot, who will be co-pilot and navigator on the projected non-stop flight to Rome.

Bertaud, who was scheduled to accompany Clarence W. Chamberlin on the Columbia, withdrew on account of differences with Charles A. Levine. On this project he has not yet selected the navigator to accompany him. The post was offered to Commodore Herbert Hartley, the commander of the Leviathan, by Mr. Hearst, but Mrs. Hartley objected when the decision was left to her by the Commodore.

Commodore Hartley, who has crossed the Atlantic over 800 times, is an authority on Atlantic weather conditions and will aid in laying out the course to be taken by Bertaud.

XUM

Texas-China Flight

Lieut. Thomas Hardin, of Dallas, Texas, with Lieut. Herbert Kindred, also of Dallas, have been backed by Dallas capitalists for a flight to Hong Kong, China. The flyers have so far not divulged the names of their backers.

Capt. W. E. Easterwood, Jr., chewing gum magnate of Dallas, has of-

Acme Photo

fered a prize of $25,000 to the flyers making the trip from Dallas to Hong Kong in 144 hours.

Kindred is an employee of the National Air Transport Company, which has the air mail contract between Dallas and Chicago. The men are having a monoplane specially built for this flight. It will be powered with two Wright Whirlwind motors mounted in tandem.

Berlin to San Francisco

Something of a sensation in German aeronautical circles was caused by the announcement of Otto Koennecke that he would make his contemplated flight from Berlin to San Francisco in a Caspar biplane. The Caspar Works of Travemunde, Germany, is a comparatively unknown firm. The plane will be fitted with a single Junkers water-cooled motor, and will be equipped with a radio.

Koennecke plans to leave Berlin early in September for a non-stop trip to San Francisco. He will be accompanied by his financial backer, Count George Salms-Laubach, a well known German sportsman 28 years ago. A relief pilot will accompany them, but his identity has not been divulged.

Alaska to Europe

Capt. George H. Wilkins, the arctic explorer, plans a solitary flight from Point Barrows, Alaska, to Europe late this summer. His route will be across to Greenland, where he will continue to Europe if his gasoline supply is sufficient.

Wilkins has made two attempts to penetrate what he calls the "Arctic Blind-spot," accidents causing failure each time. He has a plane stored at Fairbanks, Alaska, which he will fly to Point Barrows, the northernmost settlement of Alaska. At that point he will make his arrangements and complete all the preparations for his transcontinental-transoceanic flight.

Coste to Fly Atlantic

Dieudonne Coste, well known French aviator, is planning to make a Paris to New York flight within a short time. He will fly a Brequet plane of 600 horsepower, similar to the one in which he established the Paris to Jask, Persia, record flight in 1926.

It is understood that Coste expects to gain the approval of the French government for the flight, and if the consent is not obtained that he will make a twelve stage flight around the world, attempting it in 30 days.

Windsor, Ont.-London

Phil Wood, brother of Gar Wood, the famous speed boat pilot and enthusiast, has ordered a Stinson-Detroiter, in which he will attempt a nonstop flight from Windsor, Ontario, to London, England.

The pilot plans to make the hop from Windsor to Windsor, landing as near the royal castle of Windsor as possible.

The flight is backed by Edmund T. Odette, member of parliament from East Essex, Ontario, and by other Windsor business men. C. A. Schiller, of the Canadian government aerial patrol, will accompany Wood.

London to London Flight

Capt. W. Roy Maxwell, director of the Ontario government air service, and Capt. Terry Tully, chief pilot of the northern Ontario government forest fire patrol, have been chosen as the two aviators to attempt a nonstop flight from London, Ontario, to London, England, a distance of approximately 3,900 miles. Charles Burns of this city has donated a prize of $25,000 for the venture, which will be undertaken some time this month. They will use a Wright-powered Stinson-Detroiter monoplane.

Another Atlantic Flight

Mme. Luba Philipps is planning a nonstop flight from Roosevelt Field, New York, to London. In the photograph below she is shown with Lieut.

Leigh Wade, who plans to fly around the world for a second time.

Lieutenant Wade was one of the Army Flyers who made the first trip around the world by air. He is now planning to make a similar flight and cut both the flying and elapsed time record to the minimum.

XUM

New Naval Records

TWELVE new seaplane records, six of which were wrested from Italy, were credited to the United States navy July 9 as the result of a record-breaking flight in charge of Lieut. Byron J. Connell of the battlefleet aircraft squadron.

Connell took to the air in a PN-10 seaplane, carrying a load of almost 4,500 pounds, remaining aloft 11 hours 7 minutes and 13 seconds, covering a distance of 947.58 miles. The total weight of the plane at the take-off was 21,000 pounds, 4,500 pounds of this representing a "pay load."

The new marks established are as follows:

Speed record for 1,000 kilometers carrying a load of 2,000 kilograms, or 4,409 pounds, 86.91 miles an hour.

Speed record for 1,500 kilometers carrying a load of 2,000 kilograms, 86.91 miles an hour.

Speed record for 1,000 kilometers carrying a load of 1,000 kilograms, or 2,204.5 pounds, 86.91 miles an hour.

Speed record for 1,500 kilometers carrying a load of 1,000 kilograms, 88.78 miles an hour.

Speed record for 1,000 kilometers carrying a load of 500 kilograms, or 1,102.3 pounds, 88.78 miles an hour.

Speed record for 1,500 kilometers carrying a load of 500 kilograms, 88.78 miles an hour.

The six records brought back from Italy are as follows:

Duration carrying pay load of 500 kilograms.

Duration carrying pay load of 1,000 kilograms.

Duration carrying pay load of 2,000 kilograms.

Distance with pay load of 500 kilograms.

Distance with pay load of 2,000 kilograms.

The last six records were held by Alessandro Passalvia, Italian pilot. Passalvia covered 590.3 miles, against 947.5 by Connell and remained aloft 5 hours 41 minutes 7 seconds, against the mark of 11 hours 7 minutes 18 seconds made by Connell.

The records established are for two-engined seaplanes and were made under the supervision of George H. Prudden, representing the National Aeronautic association and the Federation Aeronautique Internationale, the governing bodies of aviation.

Underwood & Underwood Photo

Lieut. Byron J. Connell, U.S.N., who established twelve new records.

The Lindbergh Tour

ACCOMPANIED by Donald Keyhoe, of the aeronautics branch of the Department of Commerce, Col. Charles Lindbergh is making a tour of the country in the interests of aviation.

This tour is sponsored by the Daniel Guggenheim fund for the promotion of aeronautics, and represents a constructive step in the popularizing of flight. Just as Colonel Lindbergh proved an unofficial ambassador of the United States while in France and was responsible for the creation of a world of good feeling, just so will he be an unofficial salesman of flying to the country at large.

Before his three months' trip is completed, the flying colonel will carry his message to seventy-five cities in forty-eight states. The following itinerary has been announced:

July 20 to 31—Hartford, Providence, Boston, Portland, Me.; Concord, N. H.; Springfield, Vt.; Albany, Buffalo, and Syracuse.

Aug. 1 to 15—Cleveland, Pittsburgh, Wheeling, Dayton, Cincinnati, Louisville, Indianapolis, Detroit, Grand Rapids, Chicago and St. Louis.

Aug. 16 to 31—The tri-cities—Moline, Davenport and Rock Island; Milwaukee, Madison, twin cities—St. Paul and Minneapolis, Little Falls, Fargo, Sioux City, Des Moines, Omaha and Denver.

Sept. 1 to 15—Cheyenne, Salt Lake City, Boise, Butte, Spokane, Seattle and Portland.

Sept. 16 to 30—San Francisco, Oakland, Sacramento, Reno, Los Angeles, San Diego, Tucson, El Paso, Fort Worth, Dallas, Oklahoma City and Tulsa.

Oct. 1 to 15—Little Rock, Memphis, Nashville, Birmingham, Jackson, New Orleans, Jacksonville, Atlanta, Spartanburg, Winston-Salem and Richmond.

Oct. 16 to 20—Baltimore, Atlantic City, Washington, Wilmington, Philadelphia and New York City.

Short stops will be made at Schenectady, Erie, Springfield, Ill.; St. Joseph, Mo.; Sioux Falls, S. D.; Lordsburg, N. M., and Abilene, Tex.

Lindbergh pointed out that his nationwide air journey is in no sense to be a personal journey.

It is being made, he said, solely to interest people in the possibilities of commercial aviation.

"People throughout the country, both on the farms and in the cities, have now come to realize that aviation is a reliable means of transportation, which has possibilities of furthering the development of our commercial life and social welfare," he said.

An interesting photo of Lindbergh taken in his Texas training days.

"In almost every section the desire to do something to advance aviation locally has been expressed.

"Many cities have honored me by suggesting that the opportunity for their people to see my plane, the Spirit of St. Louis, which recently flew from New York to Paris, would possibly advance the development of aviation through encouraging the establishment of municipal airports and focusing attention on air transportation and especially on the air mail.

"The Department of Commerce, through the kindness of William P. MacCracken, assistant secretary for aeronautics, has been most helpful in arranging the tour and I want to publicly thank the department and Mr. MacCracken for their invaluable aid. This trip is an opportunity for me, as one interested in forwarding aviation, to join with local civilian gatherings all over the country to promote the cause. The great development, which will make the United States take its rightful place in leadership, can only be accomplished by the united efforts of people all over the country."

Planes for Liner Use

Tests are being carried out to see if it is practicable to catapult planes from the upper decks of liners into the air so that passengers and mail may be handled with greater speed.

Clarence Chamberlin has already made a successful flight from the Leviathan to Teeterboro, N. J.

Chairman O'Connor, of the United States Shipping Board, is seeking the advice of aeronautical engineers regarding the idea, which was suggested by Commander Byrd. In his belief the idea is not only a possibility but entirely practical. It is his belief that the present mail carrying ships could each handle one plane, the Leviathan and George Washington two or more.

The top deck of the Leviathan is 64 feet from the water, which would enable her to launch planes from a runway with ease. It is the opinion of Capt. Herbert Hartley of the Leviathan that his ship could handle four such planes.

Under such a scheme mail for outgoing liners could be delivered to the liner for twenty-four hours after the sailing. In this way much important mail could be placed on board the steamer after sailing time and eliminate the delay of days that would otherwise follow. In emergency cases passengers could be landed from the ships, or on the ships, by means of the planes.

Walla Walla Airport

Chairman Art Thomas of the Walla Walla, Wash., chamber of commerce aviation committee has announced plans for putting in shape the local landing field. It is on the government reservation, and will be cleared of rocks, and oiled.

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The Vanishing Gypsy

IMMEDIATELY after the war the aircraft industry was in a more or less chaotic state. Production had been speeded up for war needs, and the capacity of the various factories making aircraft and all pertaining to them was far in excess of a regular peace time demand.

Used planes and surplus planes were a drug on the market. The country was full of pilotless planes and planeless pilots who had been trained in the hard school of war.

Here and there a venturesome spirit turned to the air as a means of livelihood. The people as a whole were interested in flying and air circuses became an attraction at fairs and carnivals.

The Gypsy Flyer soon became a more or less familiar figure. A fair field adjoining a good road, any kind of a crate that would fly, a come-on sign and a pole with a sock on it—enough equipment for anyone. Rides at $25.00, at $10.00, at $5.00—for any sum to pay for gas, oil and the absolutely necessary repairs.

But no one can laugh at these Gypsies. They were the men who were keeping flying before the public, bridging the gap between war flight and the coming commercial and pleasure use of the plane. They initiated thousands of people into flight, and they implanted the flying germ in many of the younger pilots of today.

Trained in the rough school of war, ingenious, used to taking chances, these men barnstormed about the country. As they gradually drifted away from the precarious business of earning a living by flying in exhibitions and running up greenhorns for thrills, they were succeeded by the younger generation of airmen.

The new crop had not had the benefit of war work. Also, they were not under some of the disadvantages of that type of training. The country was full of youngsters anxious to fly for the thrill and romance of it. Here was a coming business that would be fun, fun mixed with spice and with little resemblance to work. Once in a while would be found a serious youth or an old-timer, still in the business, that had a true vision of the future of flying—of the possibilities of air transport.

There was no Safety Code in existence. Traffic rules for the air were a matter of common practice only, but no one had formulated them. There were no regulations as to use of fields, nothing to prevent a pilot from taking up an utterly unfit ship.

With the safety regulations existing today, involving rules covering the structure, design and fabrication of aircraft, specifications, design, assembly and tests for powerplants and equipment, and qualifications for aviators, it seems almost incredible that so short a time ago the business of flying was carried on in such a hodge-podge fashion.

Legislation is going to do away with the Gypsy very shortly—for the good of Aviation; but before he passes let us see how he connected up the present era of Air Transport with the War Era. It was the Gypsy who made Flying a "Game," who introduced thousands of people to the thrill of looking at things from a totally different angle. He might have been a "Flyin' Fool"—but, he flew.

Here are some excerpts from the story of a flyer, still a young man, who has gone through the mill from the stunt-flying, gypsy period down to the present day of regular air lines, scheduled traffic, thorough schools and rigidly enforced air regulations.

No one can read of these experiences without feeling some sort of a thrill. The old-timer's reaction will be different from that of the casual reader. He will be able to appreciate the chances taken and the "percentage."

"In February, 1922, I bought an old dilapidated Jenny at Waseca, Minn., for $600. "Speed" Holman, the winner of the Stunt Event at the St. Louis Air Meet, was to fly it to Chicago for me, and arrived at the Checkerboard Field, west of Chicago, with no trouble. In making the twelve mile hop to the Ashburn Field at Chicago, he ran into a snow storm and missed the field. The men at Ashburn heard him fly over the field, but could not see him next morning and it was assumed that he had been forced to land in the lake, and was lost.

"As a matter of fact he had descended at Dwyer, Indiana, and had neglected to telephone his whereabouts. He appeared at the field just as the newspaper reporters were talking to me about his loss in the cold waters of Lake Michigan.

"I took a couple of hours instruction at Ashburn and then had the ship brought to a field on the north side of Chicago, nearer my home. I rented it to a pilot who used it for passenger carrying at Deerfield, but one day he took the telegraph wires at the end of the field down with my Jenny and she had to be rebuilt completely.

"I put in about twelve hours solo time and then traded the Jenny for a Thomas Morse scout. The Tommy was a faster plane than the Jenny and I expected to install dual control in it as I would need more training with an instructor before I could really fly the Tommy. It took so long for them to get at the job that I finally got tired of waiting and took the Tommy out and managed to fly it without too much trouble.

"One day, in landing at Paducah, Ky., I broke the four rear longerons in trying to get into a small field. As it would take about two weeks to get the necessary supplies to Paducah so that I could make the splices on the broken longerons, I got eight pieces of scrap iron and tied them to the broken longerons with hay wire.

"The longerons are the four pieces of steel tubing, or wood, that form the main support and structure of the fuselage. Should they break the control surfaces of the plane would fall off and the plane would become unmanageable and fall to the ground.

"Beginner's luck held good and I

reached St. Louis just at dark. An aircraft company at St. Louis spliced the longerons for me and I took off for Chicago. Outside of running into a bad fog and being forced down on account of a broken throttle rod I reached Chicago without a mishap.

"The Tommy had been eating money up and, bringing nothing in, which was not my idea of aviation, so I decided to trade it off for a machine that would hold more than one passenger and would not need such a large field in which to land and take off. I finally got in touch with a man in Pittsburgh and arranged to trade with him for an 0X5 Standard.

"Outside of breaking a cylinder stud the trip to Pittsburgh came off all right. When the stud broke and let the water out of the engine I was in sight of the field at Cleveland and was just able to glide into it. Glenn Martin was there and through his courtesy one of his mechanics made the repair for me. Half way to Pittsburgh I ran into a snow storm and had to wander around for two hours looking for the aviation field. The gas gave out and I had to land two miles from the field. I made the trade for the Standard and flew it back to Chicago without any trouble.

"We had tried carrying passengers for joy rides in the small towns around Chicago, but did not have much success as we had no way to attract people to the field. Finally I bought an exhibition parachute. This form of chute is packed in a big bag strapped to one of the wing struts. The jumper climbs out on the wing to the strut and then straps on the parachute harness. When he arrives in a position from which he believes he can drift into the field he pulls the cord at the mouth of the bag, the chute opens, fills and drags him off the wing.

"We put out several thousand circulars announcing a parachute drop from 2,000 feet at Winnetka, Ill. We had only one plane, but there were enough people on the field to watch the event to net us $200 for the evening. One of the mechanics had volunteered to make the jump, so I tied the parachute bag to the wing strut and took off. When I motioned the mechanic to get up on the wing (we were up 2,000 feet) he started to do it, but the blast of the propeller struck him with such force that he got cold feet.

"I circled the field several times, trying to get him out on the wing to make the jump, but he wouldn't do it, so I flew the plane over to another field and took on a pilot. I was determined not to disappoint the crowd and decided to make the jump myself. All I remember about it is that I was so busy thinking about how the harness should be strapped on, and how I was to climb out on the wing that I didn't have time to be afraid. The parachute opened perfectly and I landed in a plowed field a short distance from the landing field. The parachute was a great success in getting people to the field and we used it many succeeding Sundays with good results.

"Then we secured a contract to make a jump to land on the roof of a rug factory on the west side of Chicago I had a professional jumper hired for the jump, which was to net me $500, and just before the event was scheduled the jumper made a jump for fun and broke his leg. That put him out of the money and I couldn't get any one to agree to try it, so I had to plan on making the jump myself. On the day the jump was advertised we took off in a rain which became so heavy by the time we were up a thousand feet that the motor began to miss. We were just over the center of Chicago when the motor died completely. The pilot was an old-timer, and he side-slipped her almost all the way to the ground, and by ground-looping when he landed we managed to get down safely on the football field at Humboldt Park.

"Next morning a crew from one of the local factories came out to disassemble the plane and haul it to the field. Before starting their work they measured the field and found it to be 800 feet long and talked me into flying the plane out of the field. Fool's luck held and I made it, with a few inches to spare over the top of a three story apartment building.

"I began to receive commercial contracts for flying for advertising purposes. My plane was a billboard and I distributed circulars and samples from the air. One morning I had a chance to talk it over with the judge. I dropped candy samples in the crowd at Stagg Field during a football game between Chicago and Northwestern University. The whole mess brought up the question of flying over cities at a proper height and I was discharged on condition that I warn aviators about the Chicago ordinance which forbids flying over the city at a height of less than 2,000 feet.

"Really, there was actually no danger in the advertising stunt which I pulled off, no danger to the crowd, as I had a landing place within gliding distance even if the motor should cut on me.

"Not long after I got the idea for a jump from a burning plane. I was in Cocoa, Florida, and had just lost a good contract with a real estate firm. Curly Burns told me how often the trick had been tried, always with a failure. The spectacular part of the stunt appealed to me and I could see how big a drawing card it might be. I lay awake one night figuring out how it might be done and the next morning told Curly that if he would book the stunt I would pull it off for twenty-five percent of the gate receipts.

"Two days later he had the show booked for Cocoa Beach, and besides the drop from the burning plane there was a complete flying circus. I hunted all over Florida for an old plane and finally located an old Jenny at Daytona that could be put into flying shape without too much trouble. I flew it over to Cocoa and took it apart and then set it up again on a vacant lot in the main part of town. Whenever I didn't have anything else to do I climbed into the cockpit and opened the motor wide. It stopped traffic, brought people out of stores and proved pretty good advertising.

"The day before the show I rounded up the aviation enthusiasts and set them to work taking the plane apart. One good thing about aviation, then, was that an aviator with a little diplomacy could get half the town to help

(Continued on page 66)

Popular Aviation is delighted to give this story to its readers. Some of them will undoubtedly recognize the experiences as those of Roy Ahearn, of Chicago. From time to time we hope to be able to give reminiscences of other flyers which will entertain our readers in the same way.

The New Chicago-San Francisco Line

The "San Francisco," the first of the Boeing fleet of twenty-five planes for the Chicago run.

THE pioneer flight of the new Chicago to San Francisco air line was accomplished July 1. By August 1 the air mail lines operating between San Francisco and New York will have been taken over by a commercial organization and the facilities will be open to the public.

The initial service between Chicago and San Francisco was announced by W. G. Herron, vice-president of the Boeing Air Transport, which has taken over the mail line between the two cities. Connections will be made at Chicago with the lines of the National Air Transport Company which has the Chicago to New York mail contract.

A regular passenger service will be maintained between the Pacific Coast and Chicago. The planes are equipped to carry two passengers, mail and baggage to a maximum load limit of 1,600 pounds. The electric lighted passenger compartment is similar to that of a parlor car, containing reclining seats. The scheduled operating time is twenty-two and one-half hours between the two points. Twenty-five planes will be placed in service as fast as deliveries of the ships can be made.

The schedule adopted for the present is as follows: Eastbound: Leave San Francisco, 7:00 A. M.; Sacramento, 9:15 A. M.; Reno, 10:30 A. M.; Elko, 12:40 P. M.; Salt Lake City, 4:00 P. M.; Cheyenne, 8:00 P. M.; Omaha, 1:00 A. M.; arriving in Chicago at 5:45 A. M.

Westbound: Leave Chicago, 7:50 P. M.; Omaha, 12:20 A. M.; North Platte, 2:50 A. M.; Cheyenne, 4:30 A. M.; Rock Springs, 7:05 A. M.; Salt Lake City, 10:00 A. M.; Elko, 11:15 A. M.; Sacramento, 2:40 P. M., and arriving at San Francisco at 4:30 P. M.

Passenger connections are made with other western air lines. At San Francisco connections are made with the Los Angeles-Seattle line; at Salt Lake City, with the Salt Lake City-Pasco, Wash., line and the Salt Lake City-Los Angeles line, and with the Cheyenne-Pueblo line, at Cheyenne. Reciprocal arrangements with other air transport companies will be effected so that passengers may obtain through tickets.

The first passenger to make the flight from Chicago to San Francisco under the new management of the Air Transport was a Chicagoan, who prevailed on the officials to permit him to make the trip before the line was open for regular passenger service. His wife was dying in Los Angeles and through the courtesy of the Boeing Air Transport he was enabled to reach her side while she still lived.

I. O. Biffle, the first pilot to carry contract mail on the transcontinental system, about to leave Omaha for Chicago. Left to right, Frank Caldwell, manager of Omaha Field; I. H. White, Supt. Railway Mail; J. D. Ringer, Omaha Postmaster; P. G. Johnsone, President Boeing Aircraft Corp.; Eddie Hubbard, manager; and E. B. Wadsworth, Supt. Contract Air Mail.

Acme Photo

XUM

Current Comment

Use the Air Mail

Do you realize the extent of the Air Mail Service today? It comes as near being self supporting as the Post Office Department ever is, and it gives business a form of communication that is unexcelled for speed and safety. Thousands of dollars in interest charges are saved by the transportation of checks for collection by Air Mail. Documents can be exchanged across the breadth of this country in a time thought impossible but a few years ago.

Use the air mail—send at least one important letter a day by it. You will then be doing an eminently practical thing in the aid of aviation.

The National Air Tour

Some dissatisfaction has been expressed over the rigorous rules of the Air Tour just completed. As a Reliability Tour the requirements were enforced to an extent that prevented some makers from entering their planes, and kept the entries down to the low figure of fifteen.

A better showing is, of course, to be desired; and one could wish for forty or fifty entries. However, the purpose of the Tour is to demonstrate to the great public at large that air transport and air travel is safe and reliable as well as fast. Just as the rigorously enforced requirements for the automobile races have resulted in the development of the supercharger, the small-bore, high-speed motor and other really vital improvements in the automobile, so will severe rules for the National Tour result in the development of planes having a distinct commercial value.

The Motor's the Thing

An Old-Timer, watching the stunt entertainment designed to interest a crowd waiting for the arrival of the planes on one lap of the recent Reliability Tour, made the sage remark, "These boys certainly fly with the motor."

This Old-Timer (a genuine one and not one of the new crop of 'pioneers') had learned in the hard school of the days when a motor was a tricky mechanism, and a flyer had to get the best out of his planes. Motor failure was a common thing, but it did not necessarily mean disaster. Mastery of the plane itself was a necessary part of flight.

The past seven years has seen the development of what is the most powerful, most efficient and lightest motor mechanism known. The next seven may bring an equal development in some other flying factor.

Summer Resort Service

An increasing number of planes are being sold to men who seek a fast means of transportation from their place of business to their playground. Summer resorts are necessarily a distance from large cities. For some reason train service is poor and when water transportation is available it is slow. The air provides a clean, safe and speedy means whereby a man can shut his desk in the hot city and be four hundred miles away in the woods or at the lake inside of four hours. A trip that takes a day with an automobile can be made in less than three hours by plane.

Is it any wonder that the number of private planes is increasing?

Fewer Stunt Flights

Every business must have its pioneers—men who disregard the cautious precedents of the past—but for sound development every business needs the cold and practical viewpoint.

Flying has received an untold measure of valuable publicity from recent daring flights, but there is a danger that in the rush to equal these deeds of courage the good of aviation will be disregarded and the industry will receive a measure of the wrong sort of publicity.

The attention of the world has been drawn to long distance flying. Intercontinent communication by plane has been proven possible, but not necessarily practical as yet. In the natural course of events certain of the planned attempts at distance flights, undertaken without proper preparation and without adequate instruments, will end in failures that will make the man in the street shake his head and utter the bromidic "I told you so."

This is no attempt to belittle the courage or the results of flights of men respected by the Air-minded. Nothing can do that. It is the coldly practical, the commercial minded, the dol-

XUM

Current Comment

lars and cents attitude that we need now. An event like the Reliability Tour, with proper publicity, does more to advance aviation. After all aviation is Transportation, Fast—Clean—Safe.

Government Aid

The German amazement at the power plant of the Bellanca plane has centered attention on the Wright motor. Lindbergh's achievement seemed to the French, probably from their usual temperamental viewpoint, as an individual accomplishment. The German, with his usual mechanical practicality, focused his attention on the means which enabled Chamberlin to make the world's record non-stop flight.

Aviation engineers in Germany complain that the field of air cooled motors has been neglected by their designers. The Wright motor, air cooled, and light in weight, has received an amount of international advertising that could never have been paid for deliberately. It has given an impetus to all air cooled engines.

The air cooled engine, which has received such a striking demonstration, is the product of many minds, but credit must be given to the actual aid given in its development by engineers of the United States Government. Part of the praise must go to the unsung Navy men who have worked over the problem of air cooling with the representatives of the manufacturers.

This is Government Aid in its best and most American form; not in the form of a subsidy, but as definite and practical assistance to individual enterprise.

Commerce viz: Safety

There is little doubt in the minds of unbiased observers that aircraft will be a large factor in the next war, if only for the reason that aircraft represents the fastest, most mobile form of transportation.

Our development of aircraft has lagged somewhat behind that of Europe chiefly owing to the fact that abroad the nations of the world have realized that peacetime development of air commerce with the consequent expansion of air facilities in factories, ports and available ships means a huge reservoir of air equipment that is readily available for national defense.

We have been lamentably slow in reaching this viewpoint. It has taken spectacular events to call the attention of this country to the possibilities of traffic in the air. We are arriving at the same stage by a different or reverse route. When the country has become conscious of the possibilities of air traffic, it will suddenly awake to the realization that the same air can be the carrier of hostile forces.

Our national defense is linked with our air equipment. Develop air facilities, build airports, use air craft, and we will soon have the factories, the personnel and the trained ability that we must utilize in case of war.

Try to Get One

If you believe that all the intending purchaser of a plane has to do is to signify his intention of buying in order to be overwhelmed with salesmen trying to sell him one, you have a surprise coming. A plane is a hard thing to secure delivery on at this time.

The demand for planes for actual commercial use is so great that transport companies at times have to pay premiums in order to secure delivery within a reasonable time. For the present development the country probably has a sufficient number of aircraft factories. Up to this time most of them have resisted the temptation to cheapen their product that large scale production entails.

The failure of the industry to attract capital seeking immediate and large returns is another factor. The wise men of aviation realize, and have always known, that a good plane represents a degree of hand craftsmanship that cannot be obtained in enormous mass production.

If you want a plane select a good one, and wait for it. It pays.

Eyes for the Navy

The announcement of Secretary of the Navy Wilbur that in the future all line officers of the Annapolis Academy classes shall be examined for physical fitness to take training for aviation is directly in line with sound policy.

One of the troubles which aviation has had to meet is the uncompromising attitude of officers of the army and navy who have never flown, have never known and do not care to know what flight is like.

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National Playground Miniature Aircraft Tournament

Conducted by
PLAYGROUND AND RECREATION ASSOCIATION OF AMERICA
315 Fourth Avenue, New York City

The National Committee in charge of this Tournament are:

ORVILLE WRIGHT
Chairman

PORTER ADAMS
President of the National Aeronautical Association of the U. S. A.

F. TRUBEE DAVISON
Assistant Secretary for Aeronautics, War Department

HARRY GUGGENHEIM
President of Daniel Guggenheim Fund for the Promotion of Aeronautics

JOSEPH LEE
President of the Playground and Recreation Association of America

WILLIAM P. MacCRACKEN, Jr., Assistant Secretary for Aeronautics, Department of Commerce

COLONEL THEODORE ROOSEVELT
EDWARD P. WARNER
Assistant Secretary of Aeronautics, Navy Department

COLONEL CHARLES A. LINDBERGH
Associate Chairman

EACH community from which competitors may desire to enter the National Tournament must have a Committee to administer the local competitions and to certify the local records. On this Committee should be the superintendent or director of the playgrounds of the city, or, where the playgrounds are administered under more than a single auspices, the superintendent or director of each system; the president or one of the vice-presidents of the Chamber of Commerce or similar organization; editors of local newspapers; a member of the Board of Education; the president or vice-president of the local aeronautical society or similar official of a local flying field or airport. Others locally desirable may of course be added.

Boys and girls up to twenty-one years of age, who attend the playgrounds of communities in the United States are eligible to compete in the tournament. There are two classes:

1. Junior—those who have not yet attained the sixteenth birthday on September 30, 1927.

2. Senior—those who are past the sixteenth birthday and who have not yet attained the twenty-first birthday on September 30, 1927.

The national events for both classes are as follows:

I. Indoor Competitions

I. *Gliders*—Any type of launching not over 6 feet above floor.

(a) Duration of flight.

(b) Distance of flight, to be measured from fixed starting point in direct line to first point of contact; flight to count as flight but not to score unless first contact is within a determined 45 degree sector with apex at starting point.

II. Motor propelled airplanes; tractor or pusher; not to exceed 40 inches over all in length or in span. All launchings to be not over 6 feet above floor.

(a) Duration of flight

1. Rubber motor only, hand launched.

2. Commercial models, rubber motor only, rising off ground.

(b) Weight carrying. Ratio of weight of load to weight of plane only factor to be scored.

1. Commercial models only; rubber motor only; rising off ground; minimum flight of 8 seconds needed to qualify.

II. Outdoor Competitions

I. Motor propelled airplanes, tractor or pusher; not to exceed 48 inches over all in length or span; all launchings to be not over 6 feet above ground.

(a) Duration of flight.

1. Rubber motor only; hand launched.

2. Any motive power other than rubber, carried in plane itself; type of launching optional.

3. Type of power optional, carried in plane; rising off water.

4. Commercial models; rubber motor only; hand launched.

(b) Weight carrying. Ratio of weight of load to weight of plane only factor to score.

1. Commercial models only; any motive power carried in plane; rising from ground; minimum flight of 10 seconds needed to qualify.

Commercial models. These planes must have an enclosed fuselage and hollow wings, and must be generally similar in appearance to real planes in commercial or military use.

There shall be three flights in each event. The same or different planes may be used. The best flight only scores.

All planes must be made and operated by the contestant. In addition to raw material contestants are allowed to purchase in finished form only propellers, bearings, propeller shaft and small metal fittings.

The finals of all local competitions must be held on or before September 5, and the results in certified reports on blank forms furnished by the National Committee must be in the hands of the National Committee at 315 Fourth avenue, New York City, by 5 p. m. Eastern standard time, September 12, 1927. The National Contest will be held at Memphis, Tenn., all day Saturday, October 8.

Announcements of those eligible to compete in the national finals in Memphis will be made by the National Committee on or before September 17. The National Committee will select from the records 5 winners, not more than 1 per city for each event in each class and competition. The National Committee reserves the right to qualify more if submitted records are so close as to justify or necessitate this.

The National Committee will appoint judges for the contest at Memphis. These judges will have authority to interpret the rules, to decide any

Wide World Photo

Some of the boy designers at Akron, Ohio, with the model planes they flew at the time of the Balloon races.

technical question which may arise which is not covered by the rules published in advance, and to make new rules, if necessary, to cover local conditions at Memphis.

Contestant badges will be given to all who qualify to fly at Memphis, and to all who having local records equalling those that qualify are yet not eligible to fly at Memphis because of the one winner per event per city rule. At Memphis, winners in each event will score 5 points, seconds 4 points, thirds 3 points, fourths 2 points and fifths 1 point. Suitable awards will be given the winners, and a Grand Award to the contestant scoring the largest number of points in each class.

In addition, an award will also be made to the city which enters in the actual flights of its local contests the largest number of different contestants in proportion to the population of the city, 1920 census.

It is the hope of the National Committee that this contest will greatly stimulate originality and invention in the construction of aircraft.

The local committees and superintendents of recreation are advised that information and instructions for building miniature airplanes may be secured from the following:

MINIATURE AIRCRAFT FLIERS, by Terrence Vincent, published by the Little Loose-Leaf Library, 601 Steele street, Denver, Colo.—*Price 40 cents.*

JOHNSON'S MODEL AEROPLANES, published by Spon & Chamberlain, 120 Liberty street, New York City.—*Price* $2.00.

EVERY BOY'S BOOK OF HOBBIES, by Cecil Bullivant, published by Thos. Nelson & Co., 381 Fourth avenue, New York City.—*Price* $2.00.

BOYS' BOOK MODEL AEROPLANES, by F. A. Collins, published by Century Company, 353 Fourth avenue, New York City.—*Price* $2.00.

THINGS WORTH MAKING, by Archibald Williams, published by Thos. Nelson & Co., 381 Fourth avenue, New York City.—*Price* $2.00.

A NEELEY HALL HANDY BOY, published by Lothrap Lee & Shepard Co., 275 Congress street, Boston, Mass.

CONSTRUCTION OF KITES AND AEROPLANES, published by Manual Arts Press, Third Floor, Duroc Building, Peoria, Ill.

MODEL MAKER, by W. E. Spon, published by Spon & Chamberlain, 120 Liberty street, New York City.—*Price 10 cents.*

MODEL ENGINEER, Agents Spon & Chamberlain, 120 Liberty street, New York City.—*Price 14 cents.*

Also consult local libraries.

These books and magazines, however, should be regarded merely as suggestive.

Raw materials may be secured from:

U. S. Model Aircraft Corporation, 341 Monroe street, Brooklyn, N. Y.

John Wild (airplane woods), 510 East Eleventh street, New York City.

Ideal Model Aeroplanes and Supplies Company, 165-167 Spring street, New York City.

The above references cover general principles, plans, etc., of miniature aircraft construction and flying. Special questions may be addressed to B. C. Friedman, Board of South Park Commissioners, Cottage Grove and Fifty-seventh street, Chicago, and N. L. Mallison, Superintendent of Recreation, City Hall, Knoxville, Tenn. These gentlemen have agreed to answer, so far as they can, specific questions sent to them from Superintendents of Recreation or of Playgrounds, who accompany their questions with self-addressed stamped envelopes.

Local committees are advised that they will be required authoritatively to certify as to the facts which they will be called upon to report on a blank to be furnished them by the National Committee as to records and qualifica-

(*Continued on page* 66)

Model Airplane Construction

FEW tools are required in the making of model airplanes. A good sharp pen knife is perhaps the most useful tool. This should be very sharp, and one of the blades should be well pointed. For some delicate cutting, a razor blade is preferable to a pen knife. A ruler is, of course, essential. If possible, the model maker should equip himself with two pairs of pliers, one being of the round nose variety for use in forming hooks and other wire fittings, and the other should have a flat nose and a cutting edge on the side. A small sharp plane will often come in handy for dressing down wood. A very suitable type of plane is known as the Stanley 75, although suitable planes may be purchased at the ten cent store. For drilling the holes in propellers a No. 60 twist drill is used. This can be rotated either in a hand drill frame or in a small "pin vice" such as may be purchased from a jewelers' supply house. Two other requisites are a candle and a piece of sand paper about No. 0 grade. The above tools will enable anyone to make good models. Should the model maker have access to a woodworking shop, the use of a small circular saw and a band saw will make it much easier for him to cut out strips and propeller planks.

Materials for model aircraft construction may be grouped under four heads, namely, wood, metal, fabric and liquid. The woods used are pine, spruce, bamboo and balsa. Pine is, of course, very easy to obtain, as it is the common wood used for packing, crating and house construction. Straight-grained, well seasoned pieces should be selected, and these may be either sawed or split to the proper size. Spruce is superior to pine because of its lighter weight and greater strength, but it is seldom used for packing or building and can, therefore, probably be purchased only at lumber yards. Bamboo is a hard, light wood which is particularly recommended for model building because it possesses unusual strength, can be split to the proper sizes and, when heated, can be made to form various shapes. Bamboo comes in poles. These may be obtained either as fish poles or as rug poles. Hardware and sporting stores usually carry the former, and the local carpet merchant would probably have the latter. A discarded porch screen may be found to be made of bamboo. A few lumber yards carry this wood. Balsa wood is extremely useful in the building of the finer grades of models because it is very light and can be easily worked. Physically speaking, it is lighter than cork and half as strong as spruce. It has practically no grain. This wood is not at all common. Should the model maker be near a flying field, he may be able to obtain some from the men there. It can be bought in large pieces from John Wilde, 510 East Eleventh street, New York City.

Balsa wood may also be purchased in pieces of 40 inches long, 5 inches wide and 2 inches thick for 75 cents each from the Fleischmann Company, 701 Washington street, New York City. It is suggested that where executives have access to a small circular saw and band saw, they purchase the wood from this company and cut it up in the required sizes. The above price does not include expressage or parcel post charges. These should be added based on a weight of two pounds. It should be again emphasized that balsa wood can be properly cut only by the sharpest tools and the strips from the saw should be lightly sanded with sand paper. The subject of propeller cutting will be treated in another bulletin.

Prizes

Read about the prizes—Trophy Cups and Medals—to be awarded by Popular Aviation to the contestants at Memphis, October 8—page 52 of this issue.

Metal is used for several of the model aircraft fittings. Small nails are used for propeller bearings on the light models. These are hammered into shape, as explained in the bulletin, on metal fittings. Other fittings are made from small piano wire, which is obtainable at music and hardware stores. Sizes Nos. 10 and 15 are used, and a coil of each will provide many fittings. It is suggested that the executives purchase this wire in coils from which the boys can secure pieces. Because this wire is so hard it can be cut only by very strong pliers or special piano wire cutters. These special tools could perhaps be borrowed. Should piano wire be unobtainable, domestic wire articles can serve as substitutes. Paper clips and hair pins will do for the smaller fittings, and where stiff wire is needed, as in the propeller shafts, hat pins are useful. Ten cent stores usually handle these articles. . . . It order to reduce friction between the propellers and their bearings, small washers are used between. These are No. 14 washers, procurable at any hardware store. Dress spangles also make excellent washers and are smaller than the ones just mentioned. Spangles are a notion store product. These are very cheap; ten cents will buy enough for a dozen models.

Occasionally fine steel wire, about No. 32, will come in handy for binding small pieces of wood and fittings together. Hardware stores carry this. In the scale models, fittings for holding struts, etc., are often made out of pieces of metal tubing. This can be procured in the larger hardware stores, and often scraps are obtainable in garages. On scale models and occasionally on scientific models, metal can be soldered together to produce strong joints. This method, because of its weight is, however, seldom employed.

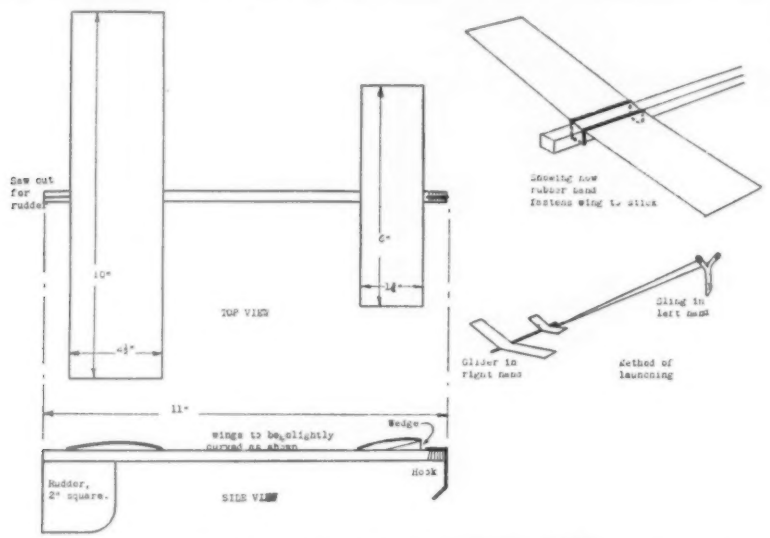
The use of fabric in model construction occurs most prominently in the wing covering. Many model makers use China silk for this purpose. Practically all notion stores carry this and it retails at about a dollar a yard. Most models require about a quarter of a yard. For the very light scientific models, thin paper is used for wing covering. This may be either Japanese tissue paper which can be purchased from Oriental shops such as Chinese and Japanese curio establishments, or rice paper may be used. Rice paper is used by draughtsmen for tracing and can be by draughtsmen for tracing supply houses, such as Muth & Co., 710 Thirteenth street, N. W., Washington,

XUM

D. C., or the Dietzgen Company, 218 East Twenty-third street, New York City. The price for a sheet about a yard square is fifteen cents. One sheet will cover about three models. Another fabric employed for covering wings is gold beater skin. This is an animal product obtained from the lining of a cow's stomach and is very thin and light. It can be purchased from the Ideal Aeroplane and Supply Company, 165-7 Spring street, New York City.

The source of power used in model airplanes is rubber. This is used in unbroken lengths which have a cross-section of about one-eighth by one sixty-fourth inch. This rubber thread costs about a cent a foot and can be obtained from the Ideal company above mentioned, from the Easthampton Rubber Thread Company, Easthampton, Mass., and from the U. S. Rubber Company, New York City. Executives may also find that this rubber thread can be purchased locally from rubber supply houses. Should some model makers prefer to use a substitute, rubber bands can be linked together like a chain to produce the desired amount of rubber. Silk thread, size A, is used for binding the parts of models together. All notion stores carry this. . . . To prevent the hooks from cutting the rubber thread motors, many model makers use a small piece of rubber tubing over the hook. The variety used is known as spectacle tubing and is handled by opticians and rubber supply houses. An excellent substitute is obtained by using the rubber covering of small telephone wire. This may be pulled off of the electric wire and similarly placed over the model hook. A half inch length is sufficient for each hook.

Liquids in model construction are used in two forms, namely, as adhesives and as wing coating preparations. The most suitable adhesive for model construction is a cement known as Ambroid. This has the advantage of being water proof, quick drying, and extremely tenacious. It may be purchased from the Ideal company, from hardware stores and from stores which sell supplies for boats. Commercial airplane "dope" and banana oil, which latter is sold by drug stores, are used for fastening the fabric to the wing frames. The "dope" is obtainable from commercial airplane supply houses, of which a number can be found in aeronautical magazines.



Sling-Shot Glider — illustrating the principles of glider construction. Drawing is not to scale.

Wing covering preparation is used particularly on silk covered wings to strengthen the fabric, make it air tight, to reduce surface friction, and to tighten it upon the frame. The Ideal company sells several wing preparations. Collodion, obtainable from the drug stores, can be substituted. A solution of strips of celluloid dissolved in banana oil makes a good wing preparation. Airplane "dope," which is used on the large machines, can be used also on models, but it should be diluted for model use. The solvent for airplane "dope" is the chemical acetone, which all drug stores sell at about thirty cents a pint.

The above material can be used to produce all airplane parts, but occasionally pieces of toys and other mechanisms are found that will lend themselves to model airplane construction. For instance, wheels for scale model airplanes can be obtained on ten cent store toy wagons. Little ten cent store celluloid canoes have been used successfully as floats for hydroplane models. Imitation radiators for the front of scale models can be built up very realistically by gluing together small pieces of soda fountain straws. Numerous other forms, such as streamlined head rests, propeller caps, etc., may be formed out of "plastic wood." This is a very useful product obtainable at some hardware stores and from James Edgerton, Ouray Building, Eighth and G streets, N. W., Washington, D. C. A one-quarter pint can is 35 cents, plus postage. This material is something like putty and can be molded into any form, but when hard it resembles wood and can be carved or painted.

How to Make a Model Glider

Definition: A glider is an aircraft which is heavier than air and has no inherent power plant.

Appearance: A glider consists of a frame and wings. Many gliders resemble ordinary airplanes without power plants, but some are radical in design.

Operation: A glider is launched from an eminence and moves through the air impelled by its initial starting impulse and by the attraction of gravity. A glider coasts upon the air. In other words, it combats the attraction of gravity with the support derived from its wings. Because a glider weighs more than the surrounding air it is always falling through the air, but it may encounter a rising current of air which will lift it upward, or in still air it will coast at a descending angle, moving forward many feet, while it is falling one foot. The duration of a glide depends on the initial launching elevation and velocity, the buoyancy of the surrounding air, the construction of the glider itself, and the kind of ground over which the glide is made. For the purposes of this tournament, the first and last factors just cited will be fixed

by the judges to be the same for all contestants. Because this gliding contest will be held indoors the buoyancy of the air will be practically the same for all entries, therefore the factor upon which successful glides will depend is construction.

Construction: Gliders are designed to move in one direction, namely, forward and slightly downward. Air conditions may cause them to depart from this position, but the glider should be inherently stable and so designed that it will regain its correct attitude, otherwise it will rapidly lose its elevation. The correct nose-down position is obtained in two ways; either by providing less lifting surface in front than in the rear, or by weighting down the nose slightly.

An elementary glider having the small wing in front can be made as follows: Procure a piece of stiff, thin cardboard or wood veneer 10 inches long and 5 inches wide. Procure also a piece of wood ¼ inch square and 1 foot long, two small rubber bands, and a piece of small, stiff wire about 2 inches long. Cut from the cardboard or veneer two rectangles, one to be 10 inches by 2 1-2 inches and the other to be 6 inches by 1¾ inches. These are the wings. Cut another piece 2 inches square and round off one corner of this to form the rudder, as shown in the side view of the drawing. The same view also shows a wedge for elevating the wing. This wedge is made by cutting off one inch of the stick and cutting it in half diagonally. The wire is bent into the shape shown for the hook and is bound to the front of the stick. In the rear of the stick a saw cut two inches long is made and the rudder inserted and glued or nailed in that cut. The wings are slightly curved, as shown in the side view, and placed on the glider approximately in the positions shown in the top view. They are secured with rubber bands, as shown in the detailed drawing, in the right hand upper corner. This completes the glider itself.

It is launched by use of a sling. To construct this, procure a crotch from a small tree limb and to the upper ends of the crotch bind a one foot length of strip rubber, which may be obtained either by linking up rubber bands or by cutting a strip from an old inner tube. To launch the glider, hold it by the rudder in the right hand with the sling held in the left hand. By stretching the rubber and releasing the glider, it can be made to make long glides and may be adjusted to do several aerial maneuvers.

Although the foregoing instructions enable anyone to make an elementary glider, the aircraft intended for the tournament should be more capable and of more detailed and careful construction. Larger wings should be used. These should be of an efficient shape and, in order that they may be light, they should be constructed in the same manner as suggested in the various bulletins on scientific models. The stick in the sling shot glider should be replaced by a light frame which should be capable of holding the wings rigidly in the proper position and yet be strong. If the contestant will study the various books on model construction which have been suggested in other bulletins and also note how the wings of a large airplane are formed, he will obtain ideas to assist him in making his glider surfaces. Practically every one will recall the recent sensational record glides made in Europe. The contestant has probably seen pictures of the gliders used. He should bear their features in mind when constructing a glider for the tournament. It will be noticed that many of the European gliders are a larger adaptation of the shape shown in the sling shot glider drawing.

In addition to constructing an efficient glider, the contestants must learn how to launch it properly. Even the best glider will not perform well unless properly placed in the air. Each contestant should experiment with his glider and determine the most efficient arrangement of the wings and weights. When this arrangement has been found, the placement of each part should be carefully marked in order that the glider may be always placed in the most efficient condition. The stipulations of the tournament decree that the launching must not be above six feet from the floor. Because gliders are capable of going the greatest distance forward when their original elevation is the highest, every contestant should make sure that he has the maximum elevation of six feet from which to launch his glider. If the contestant be so short that he cannot reach this elevation, he should stand on a chair or some other object. A horizontally suspended string at the exact height of six feet would be a good means of indicating the proper elevation. In launching the gliders, it will be found that they will perform the best when they are not thrust forward into the air but rather laid on the air with a gentle push inclining the nose slightly downward. It is remarkable what long glides can be obtained from an efficient aircraft. A reasonably good glider should be able to go forward twelve feet to every foot that it drops.

Model Airplane Fittings

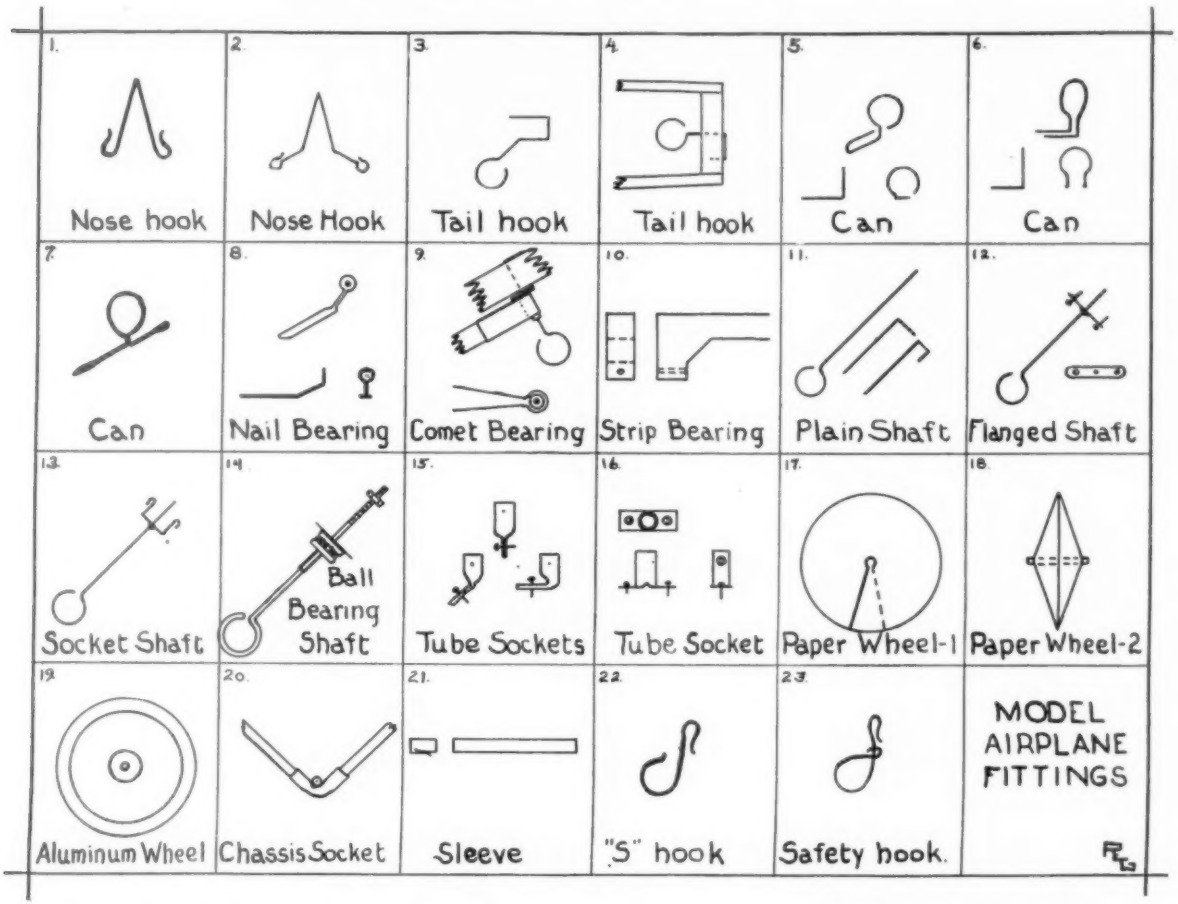
In the construction of model aircraft, various fittings are necessary to join the parts of the models together and to operate the pieces of mechanism. These are constructed of pieces of wire, metal, etc., which are found in most boys' boxes of odds and ends. In the construction of some models which differ from the usual standards, boys are very clever in making up special fittings, often making them from articles originally designed for quite a different purpose. The following examples of fittings illustrated in the drawing are typical for all model construction and can be considered either as explicit directions or as general suggestions.

In the construction of scientific models having frames consisting of two sticks open like a "V" and joined at the apex, a fitting known as a nose-hook is used at the front both for joining the sticks and holding the rubber bands which compose the motor. Two nose-hooks are shown, one of heavy and one of light construction. The first type is used where piano wire cannot be procured and it is necessary to use a larger wire in order to obtain the necessary strength. The second type is the kind generally used on the record making models and is formed of small piano wire of about fifteen thousandths of an inch in diameter. These hooks are made with round-nose pliers and the best procedure is to use a two inch length of wire in the ends of which hooks are formed, after which the wire is bent in the center to form the "V."

The next fitting shown is a tail hook

used on tractor models to fasten the rubbers at the rear of a single stick or frame. It is bent from light wire and the squared portion is made the same size as the stick and bound to it with thread. The next tail hook shown is the kind used on scale models or tractor frames where the frame itself is used to support the rubbers. As illustrated, the wire is bent back into the tail piece in order to secure it. The top in perspective and at the bottom a side and end view of it are shown. It is noticed that the large loop of the can is left open. This is often a valuable feature when the model maker wishes to remove the rubbers from the cans while he is winding them to prevent their abrasion. The next type of can is used on single stick tractors, where it is not necessary to draw the rubbers out of line during winding. It is formed by bending a piece of strip metal, preferably phosphor-bronze, although tin or brass may be used, around a short length tubing. The tubing is soldered in place. This type of bearing is used where the model has a rear brace to which the propellers are attached.

The third type of bearing shown in figure 10 is made from strip metal, preferably a piece of aluminum about



next three squares contain examples of cans or rubber guides. These are very important and useful fittings on a model because they are fastened along the sides where the rubbers pass and distribute the strain of the rubber pull. They serve the same purpose on a model that agate eyes do on a fishing rod. They are called cans because, when these were first invented by boy model makers, they were usually made out of bamboo and were barrel or can shape. Later, they were made lighter out of wire, but retained the name based on their original appearance. The first square shows the kind most commonly employed. It is shown at the The third type of can is a kind made when it is desired to use aluminum wire. The legs are somewhat flattened in order to make them more secure when they are bound on to the stick. This is shown in perspective.

Figure 8 shows a bearing which is used to support the rotating propeller shaft. It is the type most commonly used and can be easily constructed by beating and bending a small wire nail, after which a hole is drilled in the end intended for the shaft. The long part is bound to the motor frame. Figure 9 shows another type of propeller bearing known as the comet type because the profile view of it resembles a comet.

1/64th inch thick, ¼ inch wide, and 4 inches long. It is bent to shape, as shown in the front and side views, and a hole for the shaft is drilled where indicated. In using the two horizontal pieces are placed each side of the motor stick, which extends to the front of the fitting and is bound in place. Some model makers prefer to secure this bearing with small nails or screws.

The propeller shaft is, of course, very important and four types are illustrated in the drawing. Figure 11 shows the plain shaft which is commonly used. In fact, it is the trend among all model makers to use fittings

(*Continued on page 50*)

Ports

Chicago—The Great Port

AN inventory of the aeronautical facilities in the Chicago district shows that this city is by far the largest operating center for aircraft in the country. Nearly 6,000 miles of air routes actually center at Chicago. This mileage figure is larger than that of any other aircraft center.

This city also leads in the number of aviation schools and in the number of municipal airports. Excluding the mammoth lake front airport project Chicago has four sites located at different sections of the city set aside as public landing fields. The largest, now nearing completion, will have over 3½ miles of runways and will be one of the finest airports in the country. The other three have just recently been provided and arrangements are now being made for their development.

The following statistics from the survey of aeronautical activities in the Chicago District for 1926 clearly indicate Chicago's importance as an operating center for aircraft:

Centers of Air Traffic

City	Miles
Chicago	5,937
New York City	5,791
San Francisco	5,449
Detroit	5,423
Los Angeles	4,990
Berlin	4,170
Cairo	2,536
London	1,820
Paris	1,752

Production

	Air Service	Air Transport	Military	Total
Number of aircraft manufacturers*	9	---	---	9
Number of planes manufactured or rebuilt	81	6	---	87
Number of planes manufactured which are new in design	7	---	---	7
Number of firms manufacturing aircraft accessories	51	1	---	52

*Includes three companies engaged in rebuilding aircraft.

Facilities

	Air Service	Air Transport	Military	Total
Improved landing fields	10	1	1	12
Temporary landing fields	7	1	---	8
Emergency fields	2	3	---	5
Total fields	19	5	1	25
Known acreage of 25 fields	2592	640	---	3232
Hangars	16	2	2	20
Oil and gas facilities	12	1	1	14
Shop facilities	9	---	---	9
Average monthly storage rates charged by all firms	$34.00	---	---	$34.00
Number of airplanes	126	32	10	168

Service

	Air Service	Air Transport	Military	Total
Taxi Service Companies	19	---	---	19
Mail Service Companies	---	4	---	4
Photographic Companies	11	---	---	11
Special Service	20	---	---	20
Aviation Schools	13	---	2	15
Aviation Instruction	6	---	---	6
Average Hourly Fee	$23.00	---	---	$23.00

Operations

	Air Service	Air Transport	Military	Total
Number of firms or commercial operators	42	5	3	50
Owners of aircraft for sport and pleasure purposes	19	---	---	19
Private owners of aircraft for commercial or sport purposes	47	---	---	47
Total number of owners or operators in Chicago District	61	5	3	69
Mileage flown	959,012	3,170,003	122,400	4,251,415
Passengers carried	17,009	---	22	17,031
Pounds of cargo	640,321	524,257	---	1,164,578
Number of students receiving aeronautical instruction	2,574	---	722	3,296
Aerial photographs taken	4,710	---	---	4,710

Chicago's New Airport

The last legislature of the state of Illinois empowered the South Park Board of Chicago to build an airport on made land in Lake Michigan. At present an artificial island exists in the lake at the foot of Roosevelt Road and aviation authorities in Chicago are urging the Board to use this island, at least temporarily, for a landing field.

The plan of the Board was to improve this island as a bathing beach and to extend Roosevelt Road to the island by means of a bridge. Until the bridge is completed there will be little use for a beach on the island and in the meantime a landing field would be of great use to the rapidly growing air commerce of Chicago.

The location for the landing field, a half-mile south of the Roosevelt Road Island is readily accessible from the loop and other parts of Chicago, but with an existing field closer to the city it would be the part of wisdom to utilize the present island until the new one can be filled in and equipped.

The new Chicago Port is to be a

terminal station, with passenger and express facilities only. Shops and hangars will be located at more distant fields, just as with the railroad terminals. The present island is about 1,200 feet wide and nearly half a mile long.

Chicago's "Lindy" Beacon

Visitors to the Chicago World's Fair in 1933 may be greeted by a flood lighted tower 1,320 feet high, to be called the Lindbergh Beacon.

Tentative plans for this building of the huge tower have been prepared by engineers of the Electrical Association of Chicago, working under the direction of Samuel Insull, Jr., who is chairman of the centennial committee of that organization.

The idea as formulated at present calls for a tower of the stepped-off type, with a lighting system running from base to spire, and topped by a light of enormous candle power with a range of nearly 300 miles. Installation of radio direction finding apparatus and mooring facilities for lighter-than-air craft is contemplated. Several sites for the tower have been suggested, all of them close to the loop-section of the city and near the tentative sites for the new air port.

The idea of a commemorative tower originated with Edward N. Hurley, chairman of the general centennial commission. It is expected that the tower could be built for approximately $1,500,000.

Air Control Wanted

The question as to the enforcement of proper regulations for flying is being agitated in Chicago. None of the existing regulations seem to cover short flights that stay within the state. As soon as a flyer leaves the state he automatically comes under the Federal jurisdiction, but the points at issue have nothing to do with the established companies that are operating in interstate commerce.

The inspection system and mechanical service given by the various transport companies operating out of Chicago has never been questioned. The agitation is a proper one if held within bounds and the enactment of regulations is aimed at the lone operator or gypsy flyer who takes up occasional passengers.

The most frequent suggestion heard is that the state or county enact provisions which make the Federal regulations applicable to all intra-state flying. This should effectually solve the problem of proper inspection and will prevent craft that are not air worthy from being taken off the ground.

Underwood & Underwood Photo

P. G. Johnson, president of Boeing Air Transport Co., and Lieut. Charles T. Blackburn (right) assistant to Gen. Mgr. Paul Henderson, National Air Transport Co.

Air Express Service

The National Air Transport Company now holds contracts with both the Post Office Department and the American Railway Express Company for mail and express shipments by air route between New York, Cleveland, Chicago and Dallas. By the end of the summer, says Col. Paul Henderson, president of the company, the express service will be in operation between Chicago and New York.

The planes will maintain a cruising speed of 100 miles per hour and will run at first on a trip a day schedule. It is understood that the fare will be somewhat less than one and a half times railroad fare.

As fast as conditions warrant the company intends to add more trips per day. A New York to Miami service will be inaugurated at a little later date by the same company.

Rates on the new air express which goes into service on August 15 have been announced by the National Air Transport Company. The service is operated in conjunction with the American Express Company. The Chicago to New York, and the Chicago to Dallas districts hav been divided into four zones. The first zone includes points within a radius of 500 miles and the rate is 15 cents per quarter pound with a minimum rate of 90 cents. The second zone is the 500 to 1,000 mile radius, with a rate of 25 cents a quarter pound, with a minimum charge of $1.00. The third zone, 1,000 to 1,500 miles, carried a rate of 40 cents a quarter pound, minimum $1.60; while the fourth zone charge is 50 cents a quarter pound with a $2 minimum. A variable charge is added for packages of extra large cubic contents.

Cincinnati-Chicago Mail

The Postoffice Department will open bids for the establishment of an air mail service between Chicago, Indianapolis and Cincinnati on August 18.

The proposed route will connect with the transcontinental air mail and will be operated on a daily basis. The distance is only 270 miles and can be flown in three hours. The schedule calls for departure from Chicago at 6 a. m., upon the arrival of the transcontinental and Texas mail planes; arrival at Indianapolis at 7:45 a. m. and at Cincinnati at 9:00 a. m. Returning, departure from Cincinnati would be at 4:30 p. m.; from Indianapolis at 5:45 p. m.; with arrival at Chicago at 7:30 p. m., which permits connection with the Westbound and Southwestern air mail.

Under the present plan of operation the contract will be let to a privately operated company which can carry passengers and express, in addition to the mail. This will furnish rapid transportation to business men and others desiring quick trips between these cities.

Mail Planes Insured

The Independence Companies of Philadelphia, through Bowden, Gazzam & Arnold, Seattle brokers, and Barber & Baldwin, Inc., New York aviation underwriters, have insured twenty-five new airplanes which were put in the San Francisco and Chicago air mail service on July 1. The planes are to carry passengers on regular schedules.

XUM

New England Air Taxi

An air taxi service for all parts of New England was placed in operation the latter part of June by the Dennison Aircraft Corporation of Atlantic, Mass. An aircraft school is also in operation at the Dennison Airport at Atlantic. The company is eastern representative for the Kinner Airplane & Motor Corporation of Glendale, Cal., and also dealers for Waco planes, which are manufactured at Troy, Ohio, by the Advance Aircraft Company.

New Chicago Beacon

The Roanoke Building in Chicago, will shortly carry a powerful beacon for the guidance of night flyers. The light, which will be called the Greenebaum Light, will be erected on the roof of the Roanoke by the Greenebaum Sons Investment Company. The plan has the approval of William P. McCracken, assistant secretary of commerce for aviation. The investment company is putting up this light simply that Chicago may keep in the front in aviation progress.

Summer Resort Service

Paul Strasburg, head of the Strasburg Flying Service, of Detroit, opened a passenger service between Detroit, Mackinac Island and Chicago on July 5. Definite schedules will be in effect by August 1st. The company will use Curtiss sea-gull planes and will route them along the shore line.

Men having businesses in Chicago and Detroit and summer homes near Mackinac will be able to week-end in the north with little trouble, compared to the tedious land or water transportation now available. The trip will take from three to four hours by air.

Wide World Photo

Arrival in Los Angeles of "Goodwill" caravan of 17 planes from San Diego. Forty-three officials made the trip

Delegates Sent by Plane

San Diego is the first city to send visiting "Goodwill" delegates by plane. Forty-three officials of the city of San Diego, army and navy officers stationed at that city, recently made the trip between the two cities in a squadron of 17 planes of various types. The aerial caravan left San Diego and arrived at the field of the Western Air Express at Los Angeles, where they were met by officials of Los Angeles. The total flying time for the entire round trip was less than four hours.

Guggenheim Fosters Lines

The trustees of the Daniel F. Guggenheim fund for the promotion of aeronautics have announced that they have agreed upon a plan for equipment loans from the fund for the operation of passenger air lines in the United States.

Following the plan of the foundation to emphasize the safety factors of flying, the loans will go to regularly organized and already existing transport companies for the purchase of multi-motored planes that can be flown with one motor out of service.

In announcing the plan, Harry F. Guggenheim, president of the fund, stated that the plan was in effect the same as that whereby railroads made equipment loans.

The Guggenheim fund has already announced the offer of $15,000 in prizes for planes which must qualify for consideration by landing at a speed of not more than 35 miles per hour and coming to a stop in not more than 100 feet. A second condition is the ability to take off after a run of not more than 300 feet and to climb to a height of at least 35 feet within 500 feet of the starting point.

St. Paul-Chicago Service

The first regular air service between St. Paul and Chicago was inaugurated the first of July by the Northwest Airways Company. The first of the small fleet that will be put in service on regular passenger runs between the two cities carried Byron Webster, president of the St. Paul Chamber of Commerce, and Dr. L. R. S. Ferguson, president of the St. Paul City Council.

Delivering Rush Orders

The Union Trust Company of Cleveland needed a certain type of card cabinet in a hurry, and none was to be found nearer than the Rand-Kardex Factory at Tonawanda, near Buffalo, N. Y. The Rand-Kardex Company immediately sent the cabinet to Cleveland by means of the plane which the company keeps for just such emergencies. The photograph shows the cabinet being transferred to the Rand-Kardex delivery truck at Cleveland, after the 300-mile trip by plane from Buffalo.

Ports

Underwood & Underwood Photo

New Municipal Airport at Spokane, Wash., which will be the scene of the National Air Races, September 23 and 24.

Airplane Site Selection

THE selection of an airport site should be definitely linked with city planning, warns the Bureau of Aeronautics, of the Chamber of Commerce of the United States. Nearness to the business center and accessibility to the public are of prime importance, and due account should be taken of local transportation and communication facilities.

Ground communication by rail, motor or launch should be as rapid as possible in order that the benefit of air speed may not be lost. The time between shipper and addressee and not the time between airports is the important feature. Flight has no commercial value if the time saved in the air is lost between landing and ultimate destination. Zoning as well as city planning should be considered. The area adjacent to a landing field will probably have a commercial or industrial development and the height of buildings surrounding the field will be a factor affecting its usefulness.

Consequently an air field should not be located in a residential district if equally good sites are available elsewhere and the height of neighboring buildings should be strictly limited so that arriving and departing planes may not encounter unnecessary hazard.

The report of the Bureau shows that 134 cities in the country are encouraging the development of air traffic by means of local commercial organizations and chambers of commerce.

As compared with air mail the transportation of merchandise and passengers by air has developed very slowly. A few commercial lines have been established but nearly all of the packages now travelling by air are carried by air mail contract carriers.

The Bureau reports that merchants, manufacturers, bankers, and professional men are using the air mails for the transmission of a wide variety of documents and merchandise. Some of them are given below:

Advertising copy, asbestos suits, auto repair parts, bank drafts, bills of lading, commercial documents, contracts, deeds, dental supplies, drawings, specifications and blueprints, dress goods, hats, coats and suits, jewelry, machinery repair parts, newspaper stories and news photographs, orchids and other flowers, printed matter, radium and radio-active materials, stocks and bonds and rush letters.

Air express and passenger service made quite a little progress during the past year. According to reports received 5,782 passengers were carried by the six airways handling passenger business, and 1,844,455 pounds of express were transported by the four airway operators who reported handling express business. This is over and above 611,580 pounds of mail which were carried by the sixteen air mail operators including the Post Office Department.

The number of passengers carried for hire by 218 aerial service operators (those rendering cross-country or occasional services) is reported as 219, 963, while 36,624 were carried free.

Railroads Take to Air

At a meeting of the Ohio Bar Association held at Cedar Point, Ohio, William P. McCracken, Assistant Secretary of Commerce for Aeronautics, and secretary of the American Bar Association, made the statement that five large railroad companies had been in conference with him for some time with a view to the establishment of an air passenger service to supplement their regular rail service.

The supplementing of railway ex-

press service by air transport is already an accomplished fact, and the service will be in full operation within a month. The success of this fast transport is assured and will afford the railroads a demonstration of the possibilities of passenger carrying.

First Airways Maps

Civilian aviators will soon be able to secure from the Government maps covering the airways of the United States. Maps, similar to those issued

for the benefit of motorists will be available to other than the army and navy flyers. This is one of the steps taken by the government in its program for fostering and encouraging civilian aviation.

The photograph shows J. R. Fitzgerald, chief cartographic draftsman of the Coast and Geodetic Survey working on the first civil airways map to be issued. The device he is using is a mapping pantograph, which is used for the reproduction, from a master map, of smaller maps in any scale desired.

Florida-Cuba Mail

Pan American Airways, Inc., has received the United States Government's Air Mail contract for the carrying of mail between Key West, Fla., and Havana, Cuba, and in addition to establishing a line between these two cities, is preparing to operate a passenger service to Central America via Colon.

Fokker tri-motor enclosed cabin passenger planes, powered with three Wright "Whirlwind" 225 H. P. air-cooled engines, will be the equipment used on these air routes.

John K. Montgomery, vice-president of operations of the Pan American Airways, Inc., of New York, announced today the appointment of H. A. Bruno-R. R. Blythe and Associates as directors of public relations work for this aerial transportation company.

Air Feeders for Ships

Hans Schungel, American manager for the North German-Lloyd Steamship Company, has announced that his company has been in negotiation with air transport companies for some time with a view to establishing connections that will enable steamer passengers to board a plane in any large city of the country, transfer to the steamer just before departure, embark at the first European port and take plane again for his destination.

With the new ships now building for the North German-Lloyd line, it is expected that the running time between New York and Cherbourg will be cut to four days. With plane service feeding the line a passenger could make the trip from San Francisco to Berlin in less than seven days.

Tacoma Port Planned

Incorporation of the Mueller-Harkins Airport corporation of Tacoma, Wash., with a capital stock of $3,500 marks the first step toward commercial development of a landing field. Announcement of plans to construct three new hangars and of negotiations for further use of the field in a commercial way has been made by R. A. Mueller, president of the company.

The field, which contains 165 acres and is 3,100 feet by 2,280 feet in dimensions, lies within the old Tacoma speedway.

Pilot Enters Business

Another government air pilot has entered business. Wesley L. Smith, a veteran of the government air mail service, has resigned to become superintendent of the eastern division of the National Air Transport Co.

Mr. Smith has been with the mail service since 1919, and has been instrumental in the development of instruments making night flying possible.

He will have charge of the entire territory on the N. A. T. lines between New York and Chicago.

Selling by Plane

Peter Britz, of Danville, Ill., has decided that his territory, consisting of the entire state of Illinois, can be made in better time by means of a plane.

He has the entire state rights for a Columbus, Ohio, machinery manufacturer, and has purchased a plane to enable him to make the long jumps in a minimum of time.

Young Heads Branch

Clarence M. Young of Des Moines, commander of the 313th air squadron when Col. Charles A. Lindbergh was a member of the organization, has been appointed director of a newly created aeronautics branch of the department of commerce, according to an announcement made today at the office

Underwood & Underwood Photo

Clarence M. Young, of Des Moines, Iowa, the new Director of the Aeronautics Division, Department of Commerce.

of William P. McCracken, Jr., assistant secretary of commerce.

Mr. Young will act as first assistant to Secretary McCracken and will supervise the work of the entire aeronautics branch. He was originally appointed chief of the air regulations division in October.

"Awakening of national interest in commercial aviation following the successful transoceanic flights in the last few weeks has greatly increased the work of the aeronautics branch and necessitated the creation of the position," Mr. MacCracken explained.

Approximately 2,100 applications for licenses as pilot, 1,600 applications for inspection and registration of aircraft, and 2,000 applications for licenses as airplane mechanic are now on file.

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Science & Invention

New University Laboratory

The aerodynamics laboratory of the Leland Stanford, Jr., University, in California, is especially equipped for the study of propellers. Under the direction of Dr. W. F. Durand, emeritus head of the department of Mechanical Engineering, tests are being made for the government with a view to increasing both the efficiency and safety of aviation.

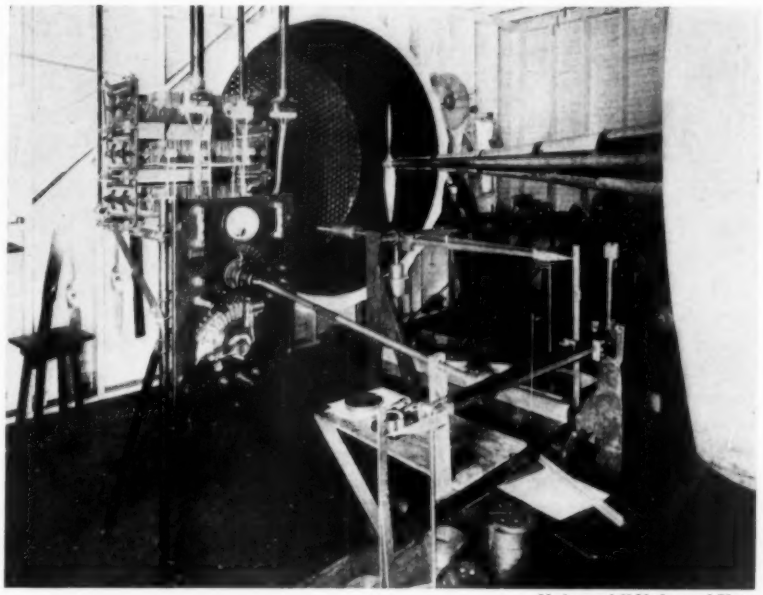
The model plane is built to scale, being about one-third of the normal size, and is hung on a shaft which extends through a conical support to the front of the plane where a propeller can be mounted and revolved at varying speeds.

Scientists have discovered by experiment that the efficiency of a propeller is determined not only by its own characteristics but also by the characteristics of objects in the vicinity. In other words a propeller might be efficient when attached to a plane with a fuselage of one shape but might fail to reach that same degree of efficiency when used on a plane with a fuselage of a different shape.

They have even placed model figures in the seats of the plane for whatever effect they may have on the "drag."

Propellers, built to scale, or actual size, may be tested in the wind tunnel. The propeller is revolved by means of an electric motor. In the photograph the electrical controls can be seen at the left, and in the center, immediately in front of the suspended propeller is the honeycomb celled end of the wind tunnel. A fifteen foot fan can be operated in this tunnel and will create a gale of any desired number of miles per hour against which the propeller operates.

Delicate testing machinery, systems of weights and counterpoises, and recording mechanisms give the data for the tests which are then assembled and compared.

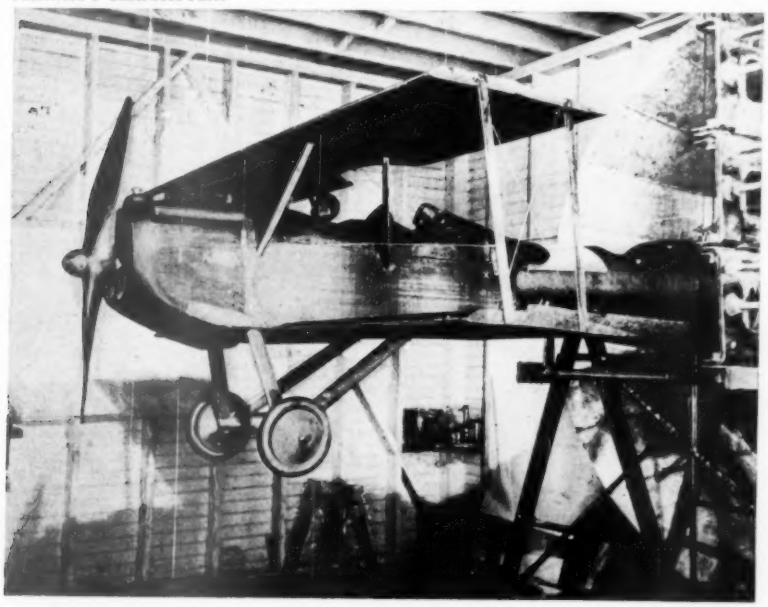


Underwood & Underwood Photo

A propeller in the wind tunnel ready for an efficiency test. Electrical controls in the foreground.

Airplane and propeller model in Stanford University Laboratory. Note figures in cockpit. Wings extend only as far as they affect tests.

Underwood & Underwood Photo



Patents Granted

Patents Nos. 1,617,263 and 1,617,264 have been granted to L. Marschall, 1710 Woodbine streee, Brooklyn, N. Y., for a device pertaining to aeronautics. The invention consists of a supplemental safety wing, to be mounted above the body of the plane and so constructed and arranged that in case the engine goes dead the plane will be enabled to glide in safety to the ground. The device is so designed that it can be built into new planes or easily applied to old ones.

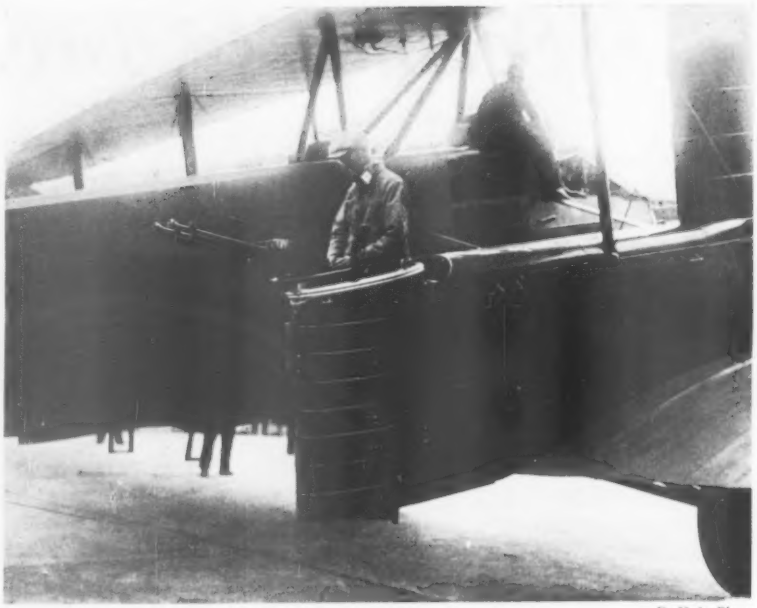
XUM

News for Inventors

A board known as the Patents and Design Board has been created in Washington, consisting of Edward P. Warner, Assistant Secretary of the Navy for Aviation; William P. MacCracken, Assistant Secretary of Commerce for Aviation, and F. Trubee Davison, Assistant Secretary of War for Aviation. The following statement of the board's activity has been made by the Navy Department.

"To this board any individual, firm, or corporation may submit a design for aircraft, aircraft parts, or aeronautical accessories, and whether patented or unpatentable, the said board upon the recommendation of the National Advisory Committee for Aeronautics shall determine whether the use of such designs by the government is desirable or necessary, and evaluate the designs so submitted and fix the worth to the United States of said design, not to exceed $75,000.

"The said designer, individual, firm or corporation, may then be offered the sum fixed by the board for the ownership or a nonexclusive right of the United States to the use of the design in aircraft, aircraft parts, or aeronautical accessories and upon the acceptance thereof shall execute complete assignment or nonexclusive license to the United States: provided, that no sum in excess of $75,000 shall be paid for any one design."



P & A Photo

View showing one of the after gun pits of the Curtis Condor. An expert is mounting the Lewis Machine gun.

The Curtis Condor in the air. The forward gun pit is not occupied and the gun is not mounted.

P & A Photo

New Army Bomber

Army officials have expressed themselves as more than satisfied with the tests of the new Army bombing plane. The new type plane is a Curtis "Condor," a two-motored biplane with duplex rudders, and stabilizers.

A crew of five is carried, two pilots and three machine gunners. There are three gun pits, one in the main fuselage, forward of the control cockpit, and the other two aft of the motor housings.

In this way the forward gunner has a range of over a hundred and eighty degrees in which to fire, while each of the after guns can control ninety degrees on either side. There are no blind spots in combat flight as one of the three gunners can always have a view of the target unobstructed by any portion of the plane itself.

The Condor is powered by two 700 horsepower Curtiss V-1350 motors, capable of driving the plane at 103 miles per hour. The gun pits carry Lewis machine guns. There is provision for carrying 2,400 pounds of explosive. The plane has a cruising radius of 700 miles.

The tests were carried out at Mitchel Field, New York, in the presence of General James E. Fechet, assistant chief of the United States Army Air Corps, and a group of officers from McCook Field, Dayton, Ohio. Lieut. Eugene Batten, was the pilot.

Broadcast Plane Talk

One of the features of the Army Show held at Soldiers' Field, Chicago, was the broadcasting by station WLS of both sides of a conversation with a plane from the Chanute Field.

People at home got a thrill when they heard the announcement—"This is Station WY 1, located in an airplane circling over Grant Park, Chicago." The Sears-Roebuck station picked up the conversation and rebroadcast it to millions of listeners.

Folding Life Raft

The rubber life boat in which Commander Byrd, Noville, Acosta and Balchen paddled ashore on the coast of France is not a very large or bulky affair when packed up.

The photograph shows Commander J. L. Callan, of the United States

Navy, carrying the complete equipment ready for stowing in a plane. The raft itself is carried packed in a bag, and the rest of the equipment consists of a pair of short paddles and an air pump for inflating the raft.

World's Smallest Plane

What is claimed to be the world's smallest plane has just been completed by two enlisted men in the United States Navy. W. F. Hopkins and T. Meade have built a single seater with a wing spread of only twenty feet. This tiny monoplane, pilot and all, weighs but 600 pounds. The photo shows the baby at the field at San Diego, Cal.

Fog Piercing Light

Experts of the Bureau of Standards have been conducting tests with two units of a new light at Hadley Field, near New Brunswick, N. Y. Raymond Matchett, the youthful inventor of the new light has been summoned to Washington to confer with officials of various governmental departments.

The light has the peculiar capacity of penetrating fog. The wave length of the light is extremely long and the rays from it are not diffused as in the case of ordinary incandescent lights. If the claims made for it, which were brought out at the preliminary tests, are proved in the final tests the lights will revolutionize night flying. It will then be adopted at all air mail fields.

The light is visible for nearly fifty miles, and can be seen as a red glow for twenty miles through the fog. The light is generated in a glass tube, hairpin shape, containing neon, one of the comparatively rare and inert gases of the atmosphere. The neon is electrically agitated by an alternating current and glows with a brilliant orange colored light. Each tube contains a reflector of caesium, a rare mineral.

If such lights had been in use at the La Bourget landing field Commander Byrd would have been able to complete his flight without a forced landing. The perfecting of some such aid to night and storm flying will add immeasurably to the safety of aviation.

Propeller-Reversing Device

C. Francis Jenkins, of Washington, D. C., has received a patent on a device for reversing the propeller of an airplane. The device, if completely successful, has great possibilities for development, particularly along safety lines.

The reversing mechanism is geared so that it cannot be operated while the plane is in the air. As the landing wheels strike the ground a spring automatically releases the safety guard on the reversing control and the aviator is free to bring the plane to rest. It is claimed that the reversing of the propeller will bring the plane to a stop within twice its own length.

An aviator would be able, with a propeller reversing device, to bring his plane to a stop as soon as he realized that his take-off would be a failure. Such a device would have prevented the wrecking of the giant Sikorsky. Sea planes would be able to land in the lee of a battleship, eliminating foundering during stormy weather.

XUM

Foreign News

German Seaplane Port

Lindau, Germany, has the distinction of being one of the first European cities to make a comprehensive effort to provide facilities for the landing and servicing of seaplanes and airplanes equipped with pontoons. A portion of the harbor at Lindau has been set aside for this purpose and equipment is provided to meet the requirements and needs of the rapidly increasing air traffic. The harbor is enclosed and is provided with landing stages, hangars, dry docking facilities and oil and gasoline service. It is in charge of a regular port authority and is operated in much the same manner as any maritime port.

South American Mail

A contract for air mail service has been signed by Caesar Miranda, postmaster-general of Uruguay, S. A., and a representative of the French Aerial Navagation Company. This is the second contract made by the French company, the first one being with the government of Argentine.

The contract calls for the commencement of regular air service between Europe and the two South American countries by way of Africa, before the end of this year.

Live Stock by Plane

The Imperial Airways provides a package service, with door to door pick up and delivery in London and Paris, and airdrome delivery in other cities. The company accepts packages up to a certain limitation of size and weight.

One continental line carried a race horse, subject to seasickness, by air to England, with no ill effect on the horse. Valuable cows have been shipped in Germany.

The London to Paris rate is rather low, packages under two pounds being subject to a tariff of approximately 50 cents, with a decreasing scale up to the limit of 150 pounds.

Spain's Big Airport

The Seville Chamber of Commerce has announced that a large airport will be built at Seville to accommodate the air traffic service that will be established with Buenos Aires. The money is to be advanced by underwriters who will be reimbursed by the government at a later date. It is expected that by the time the plane and engine works are completed that over 4,000 men will be employed at this port.

Italian Joy Flying

The Milan, Italy, Aero Club has opened a flying field for amateurs near Milan. Five planes are in service for rental for short flights and the club maintains a corps of instructors for teaching amateurs to fly. The rate is five dollars an hour and licenses to fly are granted after from ten to twelve hours of flight.

Borneo Elephant Hunt

A squadron of United States naval seaplanes made a week's cruise over the wilds of Borneo. The visit, which is for good will purposes, was under the charge of Commander R. F. Frellsen, U. S. N. It is claimed that these are the first planes to visit Borneo. Many jungles, never before seen by man, were flown over, and elephant hunting from the air attempted.

Long Business Flight

An American business man, Van Lear Black, publisher of Baltimore, has the distinction of making the first long flight for business reasons. Mr. Black left the airfield at Amsterdam, Holland, in a Fokker cabin plane and made a trip to Batavia, in the Dutch East Indies, on business.

His route followed the regularly established eastern airway as far as Kairaichi, India. The Fokker was in charge of Pilots Geyssendorfer and Scholten, who alternated at the controls.

International Photo

The Fokker monoplane just before leaving Amsterdam, Holland, with Mr. Van Lear Black for the flight to Batavia, Java.

German Record-Breaker

Pilot Steindorf, of the new Rohrbach "Roland" plane recently broke a speed record by covering a distance of 199.6 kilometers in an hour, while carrying a load of 2,000 kilos. The

former record for the same weight carrying was 179 kilometers per hour.

The Rohrbach plane is equipped with three motors each having a horsepower rating of 240. As is the case with practically all German planes the ship is of metal construction.

Planes Watch Disaster

The severe earthquake of July 11, which devastated several towns in Palestine, was actually observed from the air by flyers of the British military forces.

One of the airmen saw the minaret of the new mosque at Amman crash to the ground, and at Ramleh he saw great fissures open in the earth under him.

The air corps of the British military establishment was immediately pressed into service for relief work and medical supplies were sent by plane from Cairo, Egypt.

The planes proved of invaluable service in surveying the disaster and in directing the relief work.

Levine Hires French Ace

Lieut. Maurice Drouhin, French war ace, and well known commercial aviator, has been hired by Charles A. Levine to fly the Bellanca monoplane "Columbia" back to the United States. Mr. Levine will accompany Drouhin. When the "Columbia" is reconditioned for the transatlantic flight the two will take off from France and will endeavor to continue West from New York in an attempt to break the long distance record.

Clarence Chamberlin is known to have recommended to Mr. Levine that certain changes be made in the Columbia. One of his recommendations concerned the mounting of the instrument board, which was so affected by vibration during the Atlantic trip that many of the instruments did not register.

Drouhin was pilot for the Farman Brothers, who have been constructing a bi-motored biplane for a transatlantic trip. Observers state that with the selection of another pilot by the Farmans a race to see who will be first to fly from France to the United States may develop.

Copenhagen Air Service

A new air service between Copenhagen and Hamburg was opened last month by the Danish Air Transport Company. The company is using four-motored planes capable of carrying ten passengers and smaller Fokker planes with a six-passenger capacity.

Copenhagen now has air services offered by lines from Germany, Holland, Denmark and Sweden. A daily service is maintained with London, Paris, Brussels, Frankfort, Munich, Vienna, Prague and Dantzig. By means of connections available in Hamburg and Bremen other cities on the continent can be reached in two days travel.

Fonck Will Fly

Captain Rene Fonck, the French ace, has announced that he will make another attempt to fly from New York to Paris some time this month. He will be accompanied by Lieutenant Lawrence W. Curtin. It is expected that a Sikorsky plane will be used.

XUM

Model Airplane Fittings

(*Continued from page 39*)

which are both simple and light. This plain shaft is made from piano wire or a similarly stiff wire about 1/100th of an inch in diameter. It is secured in the propeller by bending over the end, as explained in the bulletin on propellers. Some model makers prefer to bend the end back into the propeller, but with balsa propellers this is not advisable because of the weakness of the wood.

The next type of shaft shown is used where the model maker is of an experimental inclination and wishes to try different kinds of propellers, making their replacement by an easier method than straightening the shaft as is necessary with figure 11. To construct this flanged shaft, a small flange is soldered to the shaft where shown. The propeller is secured by driving small nails or screws through the flange holes into the propeller hub. Figure 13 shows a type of shaft which is an improvement on the flanged shaft. In this type the flange is elongated and formed into a hook at each end, after which it is bent around the propeller hub. The propeller is secured to the shaft either by a piece of wire surrounding the hub and fastened to the two hooks or by a small rubber band between the two hooks. The type of rubber band that should be used is known commercially as an election band. They are about the diameter of a lead pencil. Incidentally, these bands are useful for another purpose which will be discussed under the subject of "S" hooks in this same bulletin.

Figure 14 shows a ball bearing shaft, such as is supplied by commercial model airplane companies for their better class of scale models. Some of the more mechanical model makers make these shafts themselves, but as their construction requires the use of a lathe, it will be necessary for most model makers who prefer them to purchase them. The Ideal Aeroplane Company of New York City sells this type of shaft for 65 cents each. Their only fault is their weight.

In the construction of scale models and occasionally in scientific models, particularly where the scientific models have land or water chassis, sockets are used for receiving the ends of struts and cross pieces. These tube sockets can be easily made by taking a small piece of copper tubing and cutting it off to the length desired, after which one end is squeezed together, preferably in a vice. The squeezed portion can be either left straight or bent at an angle, depending upon the position where the socket is used. Sockets are fastened to the frame by screws or nails through the tongue, and the strut, which is held in the barrel of the socket, is retained by a small nail for which a hole is shown in each view. The next view shows another type of socket also made from copper tubing by sawing a slit in one end and bending out the two sides to form a base. The copper tubing, from which these sockets are made, may be purchased at most hardware stores, but in the event that it cannot be secured, use empty .22 calibre rifle shells. Where models are intended to rise off the ground, a wheeled chassis is usually employed, although skids are sometimes used. A very serviceable wheel may be constructed from stiff paper. As shown in figure 17, a disc is cut from this paper and a scissors cut is made from one edge to the center. The disc is then slightly cupped like the cone of a radio loud speaker and the edges which overlap are Ambroided together. Then, as shown in the next view, two disc are placed together and their edges fastened with Ambroid. Passepartout tape with serrated edges can be run around the rim to strengthen the wheel. A small length of copper tubing similar to that used for the comet bearing is Ambroided in the center to insure smooth running. On the more elaborate scale models, some model makers may prefer to use more ornate wheels. These can be purchased from model supply houses. A type of aluminum wheel having rubber tires and being very attractive is sold by the Ideal company for 20 cents to $1.25 each, depending on size.

The fastening of the wheels to the chassis is often a problem with model makers. Figure 20 illustrates a possible method for accomplishing this by use of a piece of copper tubing pinched in the center and bent in a "V" shape to receive the chassis struts. The axle is fastened in the crotch of this fitting, using either wire, or thread, or rubber bands.

In the construction of scale models, it may at times be desirable to make them so that the wings can be removed from the body. To do this, tube sockets are sometimes used and often a sleeve is employed. This sleeve can be made from thin aluminum sheet bent around the spar of the wing or other wooden member. These sleeves can be purchased from model supply houses also. They are used sometimes in scientific models to enable the model maker to separate his model for packing. The last two spaces show "S" hooks. These are very useful fittings and are employed on both scientific and scale models where it is desired to unhook the rubber motors from the nose hook in order that they may be wound up with a geared winder. The first type is intended to be constructed from coarse wire and the second is intended to be made from small piano wire. As will be observed, the second type has the end of the hook turned so that it will engage the shank. This prevents it from opening up under the strain of the rubber pull. On both of these "S" hooks it will be advisable to use a short length of small rubber tubing to prevent the rubber motors from being cut. As explained in the bulletin on material, this rubber tubing can be obtained either from commercial rubber companies, model supply houses, or from the insulation on electric wires. Rubber bands of the election type are useful for fastening the rubber motors and the "S" hooks together. When this is done, the rubbers do not come off of the "S" hooks when the rubber motors are unwound.

Model Airplane Propellers

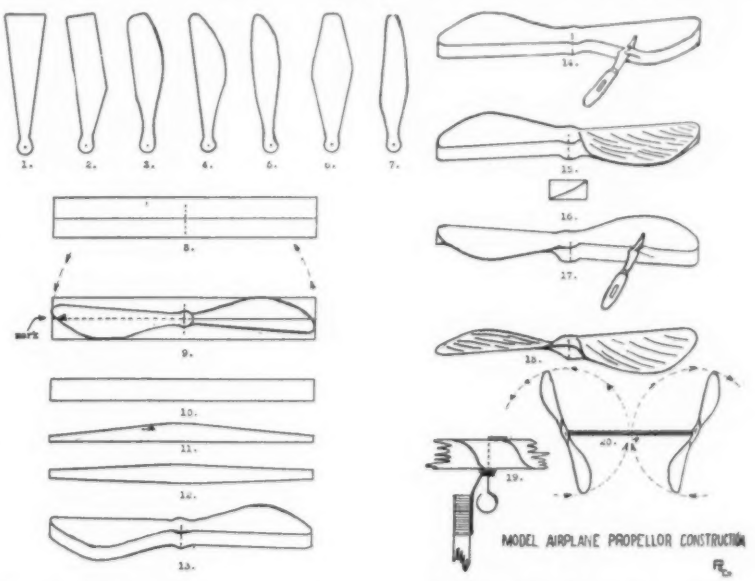
Propellers are often spoken of as airscrews, and that title explains their use. They are designed to screw their way through the air the same as a corkscrew, when turned, moves through the cork. Of course, air is less dense than a solid substance like a cork, and so an air propeller does not move forward with one hundred per cent efficiency. The difference between the distance that a propeller would advance in a solid substance and that

which it actually advances in air is called the slip. Propellers should, of course, be designed to have minimum slip. Early aircraft propellers slipped as much as sixty per cent, but modern propellers are much more efficient and only slip about twenty per cent. Model airplane propellers can be made to be very efficient because the wood of the aircraft which they propel is quite light and therefore the propellers are not retarded very much. The model maker should take a tip from this fact and make his models as light as possible, in order that his propellers may exert the maximum push.

Referring to the drawing, it will be noticed that the first seven figures show propeller blades of various patterns. Number 1 is the style used by two early aircraft pioneers, namely, Maxim of England, and Langley of America. This form is easy to make because the rough blank can be sawed out with a straight saw, and the carving itself is simple. Many model makers choose to make their propellers of this blade shape, and when the propeller is carved out they round off the corners and make a shape resembling that to the right. Other model makers prefer to cut out the desired blade shape in the blank form. Figure 2 shows the type of blade used by the Wright Brothers in their historic airplane, which was the first to carry a man into the air. It is more efficient than the Langley, in fact the Wright propeller may be described as a Langley propeller with one of the corners cut off. Figure 3 is a blade pattern used a great deal. A study of this form will reveal that it is merely an adaptation of the Wright shape with the corners rounded off. A modification of number 3 results in type 4. This shape is very popular with model fliers because it is easy to carve and performs well in the air. Blade number 5 is a further modification of number 4, and is the shape adopted a great deal by the United States Navy for use on their seaplanes. It is quite efficient. Figure 6 shows a type of blade commonly known as the diamond pattern. It is more difficult to carve than the shapes to the left, but the resulting propeller is pleasing in appearance and performance. Figure 7 shows the shape of blade used on the latest metal propellers which have been establishing world's records for performance.

Based on the foregoing descriptions, the model maker should select the type of blade which he cares to use. It may be that he will prefer to use a different shape from these suggested. Executives should encourage originality but should insure that no "impossible freaks" are used.

The method of producing an aircraft propeller is as follows: Propellers may be made of any light wood, such as pine or spruce, but for the racing models balsa wood is preferable because of its lightness and the fact that it can be easily worked. A piece of wood is obtained which will be large enough to accommodate the propeller desired. It may be stated that the smallest models require a propeller of not less than 5 inches diameter and on the largest models it is customary to use propellers of about 12 inches



diameter. This drawing was made of a typical propeller of the shape shown in figure 4, and the width is based upon a 10 inch propeller. For longer propellers the blade should be narrower and for shorter propellers it should be a trifle wider. In this typical propeller the width of the blade is 7/8 of an inch, and the thickness is 5/8 of an inch. This would do for a 36 inch model intended for general flying. If the model is to be intended for long flights the pitch of the propeller blades should be increased, which is accomplished by using a thicker blank.

Figure 8 shows a piece of wood intended for the propeller. The model maker draws upon stiff cardboard a propeller blade outline having the distance from the center to the tip 1/2 of the intended diameter. The center of the propeller blank is marked and a line drawn down the length of the block, as shown in figure 8. The center of the propeller outline is then placed above the center of the block and pivoted with a pin. Then, as shown in figure 9, the shape of the propeller outline is drawn on 1/2 of the block and a mark made on the outline where the outline touches the line on the block. The outline is then swung around to the opposite end of the block and the mark on the outline and on the block placed together, and by drawing around the outline in this second position the shape of the propeller is completed. It is very necessary, when laying out the propeller, to get the two blades diametrically opposite. This is accomplished, as stated, by placing the mark on the outline above the block line.

The next step is to drill a hole through the center of the propeller. This should be done carefully, making sure that the hole is perpendicular to the surface. In the case of a pine propeller a drill carefully adjusted should be used, but with balsa propellers the wood is so soft that an ordinary pin pushed through by the model maker will make a sufficient hole. The ideal tool for cutting out propeller blanks is a band-saw, but as these are only obtainable in established wood-cutting shops, the model maker who has only ordinary home equipment may have to use a hand-saw. This should be of the keyhole or coping variety. Although, if he has nothing but an or-

dinary straight saw he can make the major cuts with this and trim the blank to shape with a knife.

Having cut out the plan view of the propeller, we are next concerned with the profile. This may be left rectangular, as shown in figure 10, or the blades may be tapered either toward the base or from the center, as shown in figures 11 and 12. Tapering the blade usually imparts to the model greater speed, but if the model is intended for duration it would perhaps be best to leave the propeller rectangular. The blank cut-out is shown in form 13.

A right-handed propeller with a curved entering edge will be made from this blank. Considerable discussion has occurred in the past on the question of whether the entering edge of a propeller should be curved or flat. Most authorities prefer the curved edge and this preference may be substantiated by the fact that in aircraft rounded edges produce the best results. On the latest racing planes there are no square edges. Even the connections between the wings and the body are rounded off. As a practical way of deciding the question of round edges versus straight edges, a model maker recently made comparative flights, using in one instance propellers having straight entering edges, and for another flight he used propellers with round entering edges. The round edges achieved the best results.

To carve the propeller, begin cutting as shown in figure 14, and cut away the wood on the face of the blade leaving the straight edge high and cutting the round edge down to the bottom producing the result shown in figure 15. The blade should be slightly cupped, as shown in the end view of the propeller at figure 16. Turning the propeller around, the opposite blade is carved in the same way and then a small needle is inserted in the shaft hole and using this as an axle the propeller is balanced. Should one blade be heavier than the other, additional material must be cut away until the balance is perfect. After this, the blades should be sandpapered smooth. The opposite side of the propeller is cut as shown in figure 17. This second side should be carefully carved to make sure that no deep cuts are taken which cut through the blade, and yet the blade should be made very thin. The progress in cutting can be watched by frequently holding the propeller before an electric light and noticing by the "pinkness" of the wood how thin the blade is becoming. This thinness should extend to the tips of the blades, which should be about a sixteenth of an inch thick. The thickness of the blade should increase toward the hub, but the outer two-thirds of the blade should be uniformly thin. When the backs have been carved, the propeller should be again balanced and sandpapered, then the hub should be cut away in order to reduce its weight. The propellers of record making models have hubs as thin as an eighth of an inch, but for a model maker's first efforts he should have a thicker hub in order to avoid the possibility of breakage.

As above stated, the foregoing description applies to a right-handed propeller. A left-handed propeller is made by making the cuts in an opposite manner. A right-hand and a left-hand propeller are shown in figure 20.

Prizes

In order to co-operate with the Playground and Recreation Association of America Popular Aviation is announcing that it has arranged with the Association to donate the trophies, medals and badges to be given in connection with the National Playground Miniature Aircraft Tournament at Memphis, Tenn., Saturday, October 8, 1927. The prizes will consist of a trophy cup to be awarded the city which enters the largest number of different contestants in proportion to the city's population; 2 trophy cups for the winners of the Senior and Junior events (points scored); 20 gold, 20 silver and 20 bronze medals, for both senior and junior winners of each event; and bronze medals for every contestant who qualifies for flying models at Memphis. A further announcement will be made in the next issue of Popular Aviation.

Figure 19 shows how the propeller is fastened to the frame of the model by means of the propeller bearing and the shaft with its washers. These parts are described in a bulletin called "Model Fittings." As shown, the shaft is passed through the bearing and washers and into the hole. On the outside it is bent at right angles and if the propeller be made of pine it is indented and lashed to the hub. If the propeller be made of balsa, it will be sufficient to Ambroid this bent-over section in place.

The type of propeller described may be used on either a tractor or a pusher model. If used on a tractor, the model maker must so place it that it will pull the model forward. If on a pusher, it must push the air away from the model. Figure 20 shows the most efficient method of placing propellers on a twin pusher model. It is assumed that the propellers have curved entering edges and that the model is being viewed from the rear. The propellers should turn upward and outward to get the best results. It should be mentioned that in case twin propellers should be used on a model, they should weigh the same and should have the same inclination, in fact, they should be identical in push, balance, shape and weight. This will insure that, other factors being equal, the model will fly true.

As the model maker progresses, he will find out that propellers are a very important part of his model. He will learn that different models require different propellers, and that a propeller which may produce records on one model will not produce equal results on another. Inversely speaking, a model which will not fly with one propeller may fly with another type, so it behooves each contestant to study and experiment in order to obtain the utmost efficiency.

To Our Readers

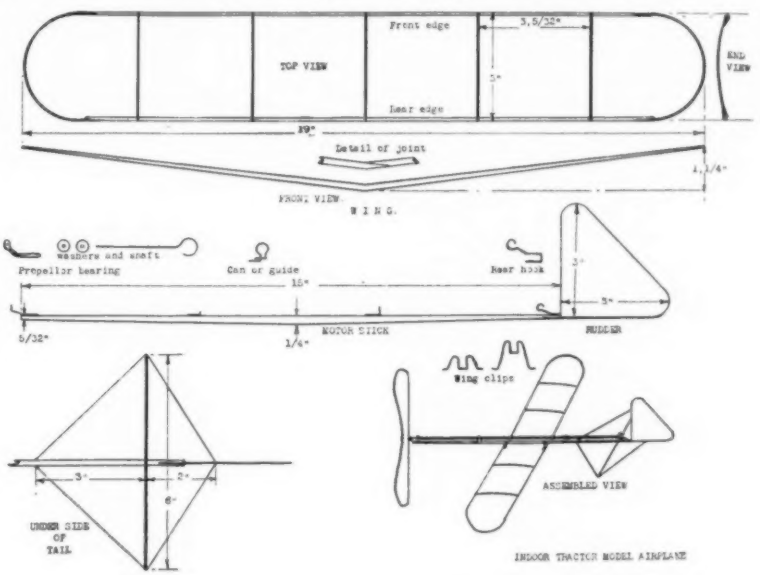
Popular Aviation is unable, at the present time, to supply its readers with detail sketches of model planes. We hope, in the very near future, to be able to furnish sketches, plans and specifications of a number of approved models that have been successfully flown by Aero Clubs. A moderate charge will be made for these specifications. Watch the Model Department of Popular Aviation.

XUM

Indoor Tractor Model Airplane

The following materials are necessary: one piece balsa wood 15 inches by ¼ inch by 3/32 inch; two pieces of balsa wood 16 inches by ⅛ inch square; one balsa propeller blank 10 inches by 1⅜ inches by 11/16 inch; five pieces of bamboo 3 inches by 1/32 inch by 1/64 inch; one piece of bamboo 5 inches by ⅛ inch by 1/16 inch; one piece of bamboo 13 inches by 1/32 inch square; one piece of bamboo 6 inches by 1/32 inch by 1/64 inch; one sheet of Japanese tissue paper 20 by 12 inches; one propeller nail bearing; one propeller shaft and two washers; two cans or rubber guides; two wing clips; one rear hook; 32 inches of ⅛ inch flat rubber thread; silk thread; banana oil, and Ambroid.

The motor stick shown in the center of the drawing is made from the 15 inch length of balsa wood. This piece, when finished, is ¼ inch wide in the center and tapers to 5/32 inch square at the ends. When dressed to size, it should be given a coat of banana oil to stiffen it. The propeller bearing is made by hammering and bending a small nail. A small hole to accommodate the propeller shaft is drilled in the front end and the bearing is bound to the front of the motor stick. The two cans are bound in place each side of the center and the rear hook is bound to the rear end. The rudder is made from the long piece of bamboo and bent into the shape shown in the drawing. The turns can be easily made by holding the section to be bent over a candle flame and when the wood becomes heated it can be formed into the shape shown. It will be noticed that the base of the rudder is extended beyond the upright portion and bound to the motor stick under the rear hook. Ambroid should be used in all of the wrappings and joints. When using Ambroid, coat each of the pieces to be joined and let them dry. Then apply a second coat, allowing the Ambroid to set. To cover the rudder, give the frame a coat of banana oil and lay a piece of Japanese tissue paper over the frame. Press the paper against the frame so that it will adhere, and when it is dry trim off the excess paper with a razor blade. The horizontal stabilizer is made by Ambroiding the six inch length of bamboo to the under side of the motor stick one inch from the rear. The center of a piece of silk thread a foot and a half long is tied to the base of the rudder at a point one inch from the end of the motor stick. The two ends are then carried around opposite ends of the bamboo tail piece and fastened to the motor stick three inches in front of the bamboo piece. A touch of Ambroid should be given where the thread passes the bamboo stick and where it is tied. When this tail frame has set, it should be covered on the under side with a piece of Japanese tissue paper in a similar manner to that employed for the rudder. In trimming the paper, however, a sixteenth of an inch margin outside of the thread should be left in order to avoid cutting the thread when trimming.



INDOOR TRACTOR MODEL AIRPLANE

To form the wing, the two 16 inch pieces of balsa are given a slanting cut in the center and rejoined as shown in the detail view, thus forming a slight upward angle. The three inch lengths of bamboo which are to be the ribs are slightly heated and curved as shown in the end view. The end of each rib is then split for a short distance and fastened to the front and rear wing edges. Ambroid should be employed in this joint. When this ladder-like frame is completed, the unused pieces of bamboo remaining should be bent into a semi-circle of three inch diameter and carefully split in half, making two ends of the same shape. These should be Ambroided in each end of the wing frame and, in order that the edges of the wing may be a continuous line, a slight recess is cut into the ends of the balsa pieces. Before covering the wing frame, two wing clips are made to the shape shown in the detailed drawing near the assembled view. The center section of these wing clips, which are made from small piano wire, should be of such size that it will grip the motor stick. This gripping should not be so tight that it will injure the motor stick nor so loose that it will not be a strong support. In the right hand clip the distance between the bottom of the stick portion and the bottom of the two legs should be 7/16 inch. The left hand wing clip is bound and Ambroided to the front spar of the wing and the right hand clip is similarly fastened to the rear spar in the center. The wing can now be covered. This is the most important covering job on the model, and if the tissue paper is wrinkled, it should be ironed flat with a warm iron before applying. The section of paper between the two wing clips can be cut to fit, but the rest of the paper can be left overlarge and trimmed after the banana oil has set. In covering this wing, proceed from the center, doing one section at a time, making sure that the tissue paper is pulled tightly so that the finished job will be unwrinkled.

The propeller is carved from the balsa blank in the manner explained

in the propeller bulletin. The propeller shaft is made from piano wire and two washers are used on the shaft between the bearing and the propeller to cut down the friction. The length of rubber thread is tied in a loop, using a square knot, and strung on the model between the two hooks and through the two rubber guides. To assemble the model, the wing should be fastened on the under side of the motor stick by placing the stick in the two clips. Because the rear clip is higher than the front one, the wing is placed at the angle which is necessary for proper lift.

To fly the model, wind the propeller in the opposite direction to that intended for flight, turning it several hundred times until the rubber thread is tightly twisted. To launch, hold the propeller with one hand and the model in the center with the other hand, and cast it gently forward. If the motor climbs too steeply, the wing should be set back or adjusted to have a less angle of inclination. If it noses down, the wing can be set forward or inclined steeper. When the right place for the wing has been found, it should be marked so that the model can always be properly adjusted.

If properly made with careful attention to having all parts true and accurate, and if the model is correctly adjusted, it should fly for at least a minute. Models of this same design have flown for two and three minutes. When flying indoors, the rudder should be bent by first breathing upon it and then bending it slightly, holding it until the heat generated by the breath has cooled, when the rudder will remain slightly curved.

Dane Plans Ocean Hop

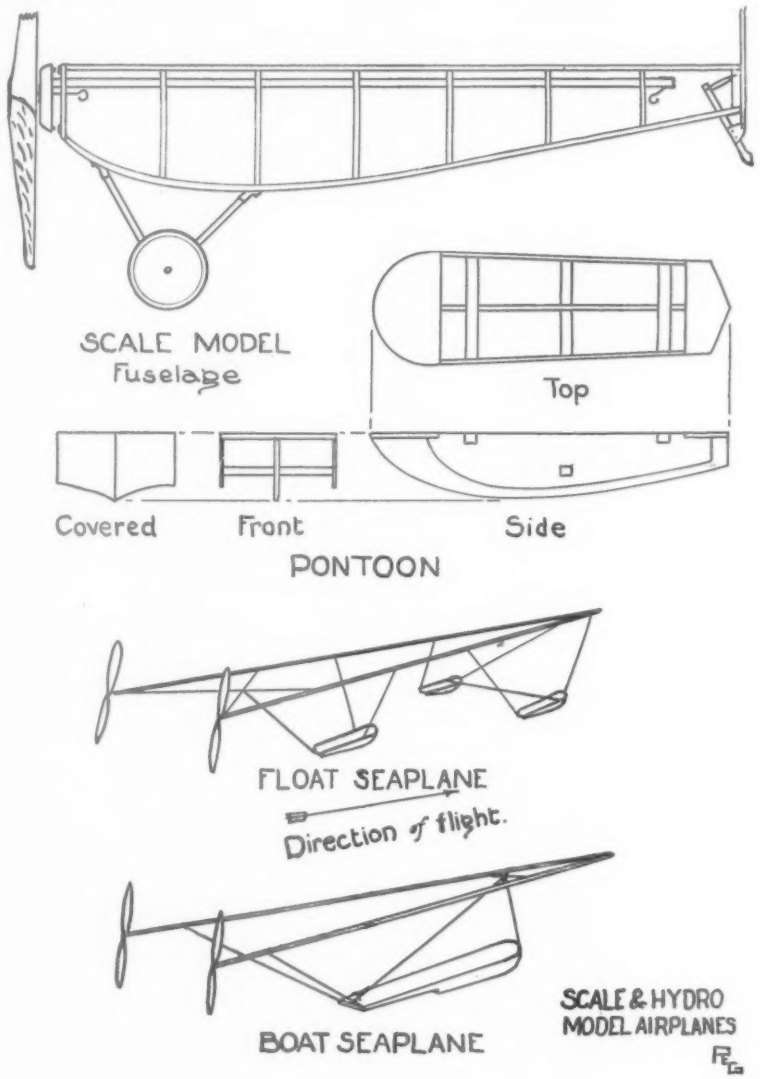
With a paid passage reserved in advance by a traveller, the Danish aviator Christian Johannsen is making arrangements for the purchase of a Fokker monoplane similar to the one used by Commander Byrd. Johannsen, who is a pilot for the Danish Air Transport Company, has been asked by T. G. Jungersen, a Danish inventor of New York City, to fly to New York and return to Denmark with one passenger, and to name his price for the passage.

Jungersen, who is said to be a rich man through the sale of his inventions, cabled Johannsen to make the arrangements. Johannsen plans to use a giant Fokker, but will have to make a stop in England for fueling.

Scale and Hydro Model Airplanes

The making and flying of scale model airplanes is very interesting because during their construction their maker learns many details about man-carrying aircraft and when, in addition to its attractive appearance, the model also possesses the ability to fly the "thing of beauty becomes a joy forever." There are many descriptions of scale models and instructions for making them, which are easily available to model makers throughout the country. Therefore this bulletin will confine itself to a few remarks upon the subject and recommend the best sources for procuring more complete descriptions.

The drawing shows a general type of scale model fuselage. The shape, of course, would vary in various instances to correspond with the original. The general procedure in making a scale model fuselage is to build it up by longitudinal strips and short upright struts. For a 3 foot model the size of wood of these strips and struts is about 1/8 inch square. The drawing illustrates a method of attaching the chassis and tail skid. The latter may be pivoted to the rudder post extension and fastened at its upper end with a rubber band so that it will cushion the shock of landing. The chassis struts may be fastened to the fuselage with



small tube fittings and may be one continuous U-shaped piece or joined at the bottom with a "V" fitting as suggested in the bulletin on fittings. The problem of installing a rubber motor in a scale model is sometimes a complicated one, due to the inaccessibility of the rubber in the enclosed fuselage. Not only does their enclosure make them difficult to install and repair, but occasionally during winding the rubbers will break and their consequent recoil often damages the fuselage itself. An excellent method of overcoming these faults is as follows: instead of having the propeller shaft fastened in the ends of the fuselage and the tail hook secured to the rudder post—a method which has the above disadvantages and also frequently results in distortion of the flying surfaces when the rubbers are wound—the power plant is made one complete unit including the nose of the model. The rubbers are strung along a motor stick which absorbs the twist of the rubbers without distorting the rest of the fuselage. This power plant assembly can be removed from the rest of the model for adjustment and can then be wound by means of a geared winder. It is made detachable through the use of dress clips of the snap type. These can be bought at notion stores in various sizes and can be fastened to the model itself either with wire or small nails. Some model makers who might not care to adopt this method and yet have the choice of a detachable power plant may originate wire clips or other original fittings for accomplishing this same purpose.

The method of attaching the wings to the fuselage is the same as is used for large machines, and the construction of the wings themselves is similar to the methods used for other models which have been described in previous bulletins. Should the model maker desire plans and specifications for particular models, these may be procured in many varieties from the Ideal Model Airplane and Supply Company, at 165-7 Spring Street, New York City. The price for plans is about 25 cents each.

The flying surfaces and power plants of hydro models are similar to those of other scientific models, and in addition floats are attached to enable the model to take off and alight on the water. Floats, or pontoons, may be of various patterns. An efficient type is shown in the drawing. Four views are included which readily explain its construction. The size of the pontoon would vary with the size of the model to be supported, but as a guide it can be said that three pontoons of the above pattern, 5 inches long, will support a 3 foot scientific model. These pontoons may be grouped with two in the front and one in the back, or vice versa. The drawing suggests an arrangement, of two in front and one in back, because this gives the most stability in taking off and landing. The struts should be of bamboo and in addition to the bamboo parts bracing wires may be used. In the drawing the wings and some other parts of the model are left out in order to better show the pontoon arrangement. Small wing floats are used to balance the model.

The bottom drawing shows the type of hydro model known as a boat seaplane in which one large pontoon takes the place of several smaller ones. This class has often demonstrated its ability. It is customary when employing a large float to put a step in the under surface to decrease the drag of the water. This feature follows standard hydro-plane practice. The construction of this large pontoon may be similar to that suggested for the small pontoons with the addition of the step.

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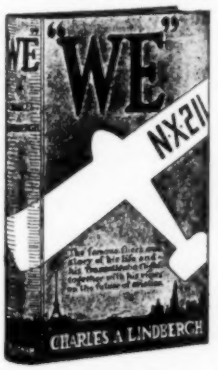

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See page 52

An A B C of Aviation

THE airplane is a vehicle, carrying a crew and cargo, designed to navigate the air, just as a boat is designed to navigate the water. The general problems involved are much the same in the two cases. Both must have the following essential parts.

A. A means of supporting the craft in the medium. In the case of the airplane, this medium is the air.

B. A proper housing for the crew and cargo which is carried.

C. A means of propelling the craft in the medium.

D. A provision for the navigation of the craft; that is, the crew must be able to steer it in the desired direction and keep it under proper control at all times during the trip.

Boats, either surface craft or submarine, depend upon the principle of Archimedes for sustentation. That is, a body submerged in a fluid is buoyed up by a force equal to the weight of the fluid displaced. The sustentation of a gas balloon in the air depends upon the same principle. A boat may remain suspended in water, or a balloon in air, without motion. An airplane is much heavier than the air it displaces and cannot remain suspended in the air without motion.

The difference between the balloon and the airplane may be best illustrated by the difference between a motorboat and an aquaplane, a small board which is towed behind a motorboat going at a high rate of speed. Everyone has seen pictures showing swimmers riding these aquaplanes. Sometimes as many as three people are seen riding a board that is barely three feet square.

When the boat that is towing the board stops, the board sinks, since the buoyancy given by the board when merely floating on the surface of the water is not sufficient to sustain the weight of the people who are riding on it. The dynamic forces set up by the board when being moved rapidly through or on the top of the water provides the additional "lift" required to support the persons who are riding on it.

As the medium through which the aquaplane board is moving is water, the force is said to be hydrodynamic. This force is directly proportional to the speed at which the board is being drawn through the water. In other words, the faster that it is drawn through the water the more weight it will carry. It is obvious that the aquaplane board when in motion is creating upward forces enough to support considerable weight. The motorboat merely gives it forward motion. The theory being that when any surface is set in motion with its forward edge inclined slightly upward there is a force created by the medium through which it travels acting vertically to it.

This force is known as "lift."

In exactly the same way the wings support the airplane in flight. We know that without the forward motion of the motor boat the aquaplane board could not support a man's weight and, in the same way, without the forward motion created by the propeller-engine unit of the airplane it could not fly.

This forward motion or force is known as "thrust."

Thus we have two forces, "thrust" and "lift," which tend to pull the airplane forward and upward, but to do this they must first overcome two directly opposing forces. These forces are known as "gravity" and "resistance."

Gravity is synonomous to weight, and is that force which tends to pull all things toward the center of the earth.

Resistance is set up by the viscosity of the air to a body in motion through it and is known as "drag" in airplane work. It can readily be seen how difficult it would be to move a body through a viscous liquid such as molasses. The molasses would stick to it and retard its motion. In the same way the air, which is also a viscous fluid, retards the progress of the airplane. Whereas the viscosity of air is not nearly so great as that of molasses, it is there never-the-less and is a factor of considerable importance. It is, therefore, important when building an airplane to cut down "drag" to the minimum. We have now described the four major forces which act on an airplane, "thrust," "lift," "drag" and "gravity."

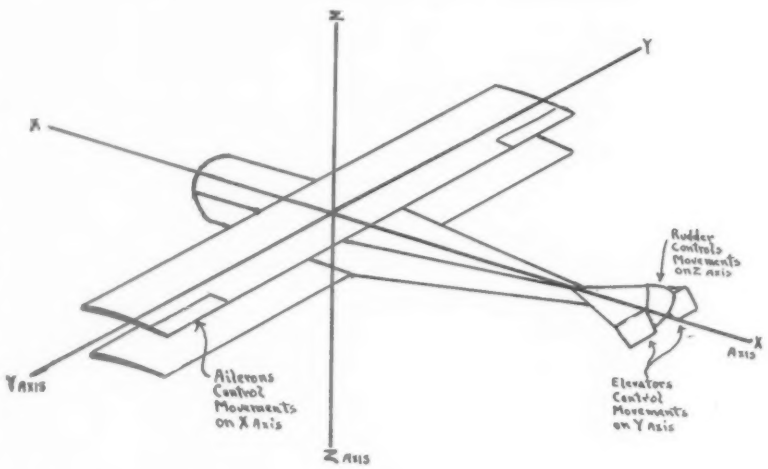

Diagram showing the axes of an airplane and the effect of controls on the plane.

Before the airplane leaves the ground its "thrust" must overcome "drag" and its "lift" must overcome "gravity." Generally speaking, this is what happens when the airplane is leaving the ground, that is to say, when it is climbing.

When the pilot has attained alti-

tude sufficient for his purpose he must equalize these forces, which he does by manipulating the controls in such a way that the airplane will fly level and cease to climb. When the pilot desires to descend he must control his airplane so that gravity will overcome lift and drag will overcome thrust.

ESSENTIAL PARTS OF THE AIRPLANE

The airplane, to be a practical vehicle of the air, must meet the following requirements:

1. The first requirement is a means of sustentation. The WINGS of the airplane are surfaces which are designed to give lifting forces when moved rapidly through the air. The wings are comparable to the board of the aquaplane.

2. The second requirement is that of a means of housing properly the crew, passengers, or cargo to be carried. This is the FUSELAGE of the airplane.

3. The gasoline engine, and the air screw or, as the combination is generally known, the ENGINE-PROPELLER UNIT, fulfills the third requirement, giving power to pull the airplane through the air. In the case of the aquaplane, the engine-propeller unit is the engine and propeller of the motor boat supplying the pulling force through the rope attaching them.

4. The fourth requirement is fulfilled by the CONTROL SURFACES, which are added to enable the crew to direct properly the flight of the craft. The airplane is unique in that the crew must be provided with devices to control it about its three principal axes. A boat, operating on the surface of the water needs but one conrol, the rudder, for changing directions. The submarine, when operated submerged in the water, needs but two controls; the rudder, for changing directions in a horizontal plane, and an elevator for changing directions in a vertical plane. (Climbing or diving.)

The airplane needs both rudder and elevator, and in addition a third, or lateral control. Primarily for keeping the airplane on an even keel in straight flight, or maintaining proper attitude in circling flights.

A fifth requirement may be added, since it is necessary to find some source of structure for supporting the airplane when at rest on the ground, or when starting from, or returning to the ground. This structure, known as the landing gear, has no useful function once the airplane is in flight, and is considered as an integral part of the fuselage.

The fuselage houses the crew, fuel tanks and other load that is carried. In nearly all cases the engine-propelling unit is also placed in the fuselage. Exception to this condition is found in the case of airplanes mounting two or more engines.

In this case the engines are mounted in the "nacelles" set out in the wing structure. The engine-propelling unit may be either a tractor or a pusher and the airplane is generally described as a tractor or a pusher, depending upon the type of engine-propelling unit which is mounted in it.

When the propeller is mounted on the nose of the airplane and pulls the airplane forward it is said to be a tractor.

When the propeller is mounted behind the wings and pushes the airplane through the air, somewhat as is a boat, it is said to be a pusher.

The single engine pusher is really never considered in modern airplane design for several reasons, the chief one being that the pilots object to having the engine mounted behind them. They feel that there is too much chance of the engine breaking loose from its fastenings and crushing them, even in minor crashes.

Any number of engine-propelling units may be mounted on an airplane. Where there are two, it is generally spoken of as a twin engine airplane; where there are more than two, it is spoken of as a multi-engine airplane.

The rudder provides directional control exactly as in a boat. The elevator provides control for diving or climbing. (Termed "longitudinal control") and the ailerons provide lateral control. These controls will be discussed later. The horizontal stabilizer and the vertical fins are put on to give stability in flight. These will be discussed later.

The landing gear and the tail skid are so placed on the fuselage that there will be no tendency for the airplane to tip over in any position of landing or take-off.

A study of the figures in this lesson will give an idea of the different parts in modern airplanes.

AXES OF THE AIRPLANE

The longitudinal axis is an imaginary line running from the nose to tail of an airplane through its center of gravity and in the line of symmetry of the fuselage. When an airplane turns around this axis it is said to "roll."

2. The lateral axis is an imaginary line running through the center of gravity at right angles to the longitudinal axis and in the horizontal plane. When an airplane moves around its lateral axis it is said to "pitch."

3. The vertical or normal axis is an imaginary line running through the center of gravity and perpendicular to the other two axes. When an airplane moves around its vertical axis it is said to "yaw."

We are indebted for this clear and concise explanation of some of the first principles of aircraft design and operation to the Aerial Service & Transport, Inc., of Chicago. In future articles we hope to bring the reader step by step along the hard path that our air pioneers toiled over rather blindly. So much is known now about the air and aerodynamics that one has to be reminded sharply that twenty years ago it was a practically unknown subject, and many things were accepted as facts that have since been proved fallacies. In fact it was the discovery by the Wright Brothers that a so-called accepted fact was in truth no fact but a fallacy that started them on their study of artificial flight. A grounding in the essentials of aerodynamics is necessary to any student who wishes to understand the principles of flight and the operation of aircraft.

Weather Reports Broadcast

The United States Navy, in co-operation with the United States Weather Bureau, is transmitting daily weather reports and other information of value to aviators. It was formerly the custom for the department to broadcast daily reports for mariners at 10:30 a. m. and p. m. At a series of conferences of representatives of the army, navy, postoffice, weather bureau and department of commerce, the fact was brought out that these reports came so late in the morning that they were of little value to aviators. Flyers were compelled to start flights earlier in the day without adequate information as to storm centers. This resulted in forced landings because of weather conditions and many changes of routes to avoid unpredicted storms.

The service is sent out each morning at 8:15 in the regular weather bureau code, on 8,030 and 12,045 kilocycles. These wavebands are good for daytime reception. The service is made up of the regular weather bureau reports which cover the entire United States, Hawaii and part of Canada and the West Indies.

Aerologists at the flying field can receive this service, plot the daily weather maps, and have all information in the hands of pilots by 9:30 in the morning. This will enable the flyers to start their flights with complete weather information and to choose routes to avoid adverse weather conditions.

Brief Record Holders

Due to a forced landing in the Persian Gulf, Lieuts. C. R. Carr and L. S. Gillman, of the British Royal Air Force, were compelled to abandon their non-stop flight from London to Karachi, India.

The flyers were rescued by a passing steamer. For a few hours they held both the nonstop distance record and the time record for continuous flight, as they had remained in the air 32 hours and covered a distance of 3,500 miles.

Two hours later Charles Lindbergh arrived in Paris, breaking their record by covering approximately 100 miles more distance and remaining in the air about one hour longer.

Junkers Air Sleeper

The new Junkers G-31 affords accommodations for fifteen passengers. It is designed especially for night travelling and sleeping quarters are provided for the passengers. As can be seen from the accompanying photographs the cabin is designed in much the same fashion as a Pullman.

Air travel in Europe has become a commonplace, and is used as a time saver by so many travellers that there has been a steady demand for night accommodations so that the time saved by a night flight need not be wasted in catching up on the sleep lost during the flight.

Record Balloon Flight

The world's record flight for balloons of the third category (1,200 meters) has been broken by A. U. Rasmussen of Detroit, piloting the Detroit II, in the third Detroit News trophy race which started from the Ford airport at Detroit, July 4.

Rasmussen landed at Kingston, N. C., July 5, at 6:45 P. M. (eastern standard time) to establish a long distance record of approximately 580 miles, exceeding the world's record of about 500 miles.

XUM

Aviation Talks Broadcast

On July 4 Lieutenant Swanee Taylor, of the United States Naval Reserve, inaugurated the first of a series of talks on aviation over the radio, with a talk on the History of Aviation from Station WOR at Newark, N. J.

Popular interest has been so great that a series was arranged and continued during the summer months. The scheduled talks and speakers are as follows:

July 11—"Military Aviation," Col. Fulois, U. S. A.

July 18—"How to Learn to Fly," Prof. Klemin.

July 25—"Flight Instruction," William A. Winston.

Aug. 1—"Practical Flying," Casey Jones.

Aug. 8.—"Aircraft Design," Anthony Fokker.

Aug. 15 — "Aircraft Engines," Charles Lawrence.

Aug. 22. — "Instruments," Brice Goldsborough.

Aug. 29—"Air Transport Service," (N. A. T. representative).

Sept. 5—"Landing Field and Hangars," William E. Arthur.

Sept. 12—"Future of Aviation."

Sept. 19 — "Aerial Navigation," Commander Byrd, U. S. N.

Lieut. Taylor has spoken on aviation several times during the last winter over radio. His talks will be broadcast at 7 o'clock.

Forest Fire Patrol

The national forests in California and the Pacific Northwest will be protected during the summer by airplane patrol supplied by the Army Air Corps. A number of reserve officers will be transferred from the Army Air Corps to the Forestry Service for the purpose of protecting the forests against fire.

These officers will have bases at Mather Field, near Sacramento, Cal., at Glendale, near Los Angeles, and at Eugene, Ore., Seattle and Spokane, Wash. They will be accompanied on their trips by forest officers who will act as observers.

The planes locate fires set by electrical storms, careless campers and other users of the forests.

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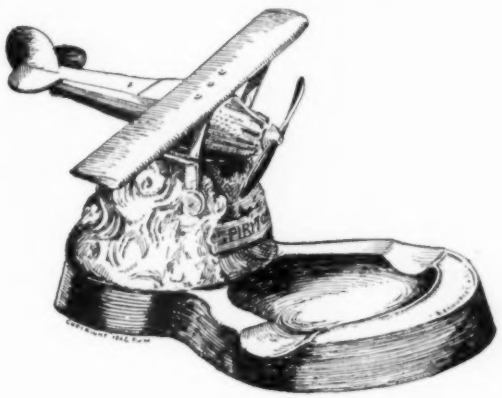

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Civil Aviation Corps

The Wolverine Civil Air Corps has been launched by Michigan upstate business men and club leaders who have been aroused to action because of the rapid advances being made by the public of Europe in becoming not only air-minded, but air-wise—actually organized in the practical handling of aircraft, airports and problems connected with flying.

It was found that their policy had been consistently to develop the movement, without publicity and noise, but letting its merit become recognized. Leading men and officials of Michigan, as well as former World War men, women's club officials, business men and flyers and young men and women who wish to become air wise, comprise the membership which is scattered over the state to the extent of several hundred well-selected leaders and air fans.

It was pointed out that the great difficulty has been that in nearly every city where public spirited persons advocated landing fields some selfish groups would propose the promotion of property for sale to the municipality. This in turn inspired other realtors to attempt the same, with the general result that greed for profit and jealousy in such cities has held back development of this greatest national need—airports.

A committee of Adcraft Club members investigated the conditions surrounding the proposed Detroit municipal airport near the east end at the river. After their investigation another investigation developed and the Detroit press came forward with the information that the Detroit Board of Commerce has recommended a site which was later adjudged entirely unsuited, one adjoining the large plant and stacks of the Edison Company, and that an overvaluation of somewhere near $2,000,000 had been placed upon it. Hence the condemnation suit, which had its second hearing, was dropped. Yet this is typical of many cities where a local clique is determined to dominate egardless of the nation's need or the good of the municipality.

The experiences and the revelations which came through the court martial of Gen. William Mitchell prompted the formation of this civil air corps movement in a way that at once made it a citizen's movement. The need and merit of the cause is too important and the issue too great to permit the entrance of party politics. The Civil Air Corps Association has already reached out to include members in Ohio and Illinois which came as a result of recognized merit, so that the name Wolverine was dropped and the charter now reads simply Civil Air Corps.

Organizations have been invited to elect representative committees to form a voting part of the central governing group. Civilian aviation training "teams" are being formed under the leadership of seasoned pilots, somewhat on the order of English plane clubs or the Lufthansa, which came in for so much praise lately.

Gaylord N. Bebout, a prominent Detroit lawyer and air fan, is state secretary; Myron B. Vorce, president, Airports Engineering Company, and distinguished during the war as a representative of the Secretary of War, a prominent engineer from Cleveland, Detroit and Chicago is vice-president, and a new president will soon be announced.

Messages from Ground

The U. S. Cavalry stationed in the Philippines have developed a method of picking up messages by airplane that will be developed by the army. The message is attached to a string held by two men and the plane, flying low, catches the message by means of a hook attached to a cable.

Flying Weather Service

The United States Weather Bureau is preparing in advance for the day of regular ocean flying. The present plans include an attempt to devise an accurate daily forecast of Atlantic weather conditions. When completed the Bureau will have a daily Atlantic service, a twice-daily summary of flying conditions, a cloud and wind study and survey of the fog situation.

The government is to receive two reports daily from each vessel in the Atlantic instead of the single daily report which is now radioed to the Bureau. At present the weather is the only thing reported, but in the future reporting ships will include data on fog, cloud and wind conditions. At a later date the government will probably have a special forecaster on some of the larger ships.

The most important plan for the study of ocean weather conditions for aviators is the tentative scheme of sending an expedition to the Grand Banks, off Newfoundland, to make an intensive study of the dense fog and clouds which hang over that region at practically all seasons of the year. The expedition will make use of small pilot balloons which will make records of air conditions so that a comprehensive study can be made.

At the present time the conditions in the north Atlantic favor west to east flying, as the prevailing winds travel in that direction. For the trip in the other direction the southern route, via the Azores and Bermuda seems the most practicable. Here the flyer has the benefit of the trade winds which blow constantly from Europe to the West Indies.

At present France supplies us with most of our Continental weather reports. A more rapid and more frequent exchange of weather reports with foreign countries will be worked out with the plan for aviation weather reports.

The reporting for the northern route will have to be worked out with the aid of the Canadian weather stations along the coast and in Newfoundland, and with Denmark, which has stations on Greenland and Iceland. These countries will be asked to increase their reports to two a day.

At the present time flyers can secure special weather reports for any contemplated flight. Professor Cox, the veteran chief of the Chicago Bureau, has supplied many special flying reports for aviators in the central west. The recent trans-Atlantic flights could not have been made without the cooperation of the New York Bureau.

New German Glider

Hans Richter, a noted German glider enthusiast and investigator, has completed a motorless plane with bird-like wings. As can be seen from the photograph the wings are sectional, and controls are arranged so that different portions of them can be moved.

Man has not yet succeeded in building an ornithopter, or wing flapping plane, but many investigators have worked on the problem of building a machine that can flex the wing tips in some such manner as a bird.

Government Publications

Report Number 256, compiled by Max M. Munk, deals with the effect of air forces on a systematic series of biplane and triplane models. The tests were conducted in the Langley Memorial Aeronautical Laboratory at Washington.

The experiments were held to determine the lift, drag and moment of each individual aerofoil in each cellule.

The report may be obtained from the National Advisory Committee for Aeronautics, Washington, D. C.

The report of tests carried out in the wind tunnel of the National Advisory Committee for Aeronautics on "Characteristics of Propeller Sections" can be obtained from the above committee, Washington, D. C.

The report was compiled by Eastman Jacobs, and deals with tests carried out under various conditions with six aerofoil sections. The results obtained provide data for the design and study of propeller sections.

Report Number 257, entitled "Pressure Distribution Over a Wing and Tail Rib of a V-F7 and a T-S Airplane in Flight," may be obtained from the National Advisory Committee for Aeronautics, Washington, D. C. The two planes selected were chosen because they represented craft with a thick and thin wing section.

Airport on Roof

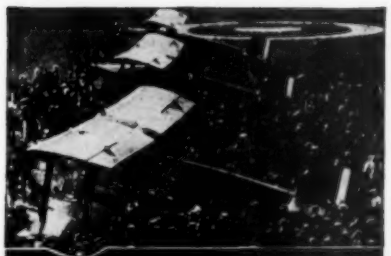
Plans announced for the new Chicago Postoffice include provision for a landing field for aircraft on the roof. Government officials believe that within a comparatively short time it will be possible for planes to land and take off from a comparatively short runway, and for that reason the roof of the new building will be so constructed that no obstructions will prevent its utilization as a landing field.

The roof of the building will provide a six-acre landing field, and although aviators in general do not believe that this is sufficient space for practical use, the action of the government's architects in making this provision is looked on with favor. It shows that the government is looking forward and is ready to utilize air transport to the utmost.

The building will be six stories in height and will be 320 by 800 feet long. Naturally this is a short runway, but devices now being perfected by some aircraft manufacturers may make the use of the roof entirely practical.

Air Liner Serves Meals

July 15 the Colonial Air Transport Company, which operates between New York and Boston, inaugurated a dining service, which will later be extended to other air lines. Food is taken on board in containers and is kept heated electrically.



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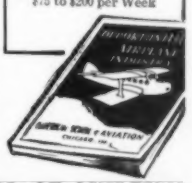

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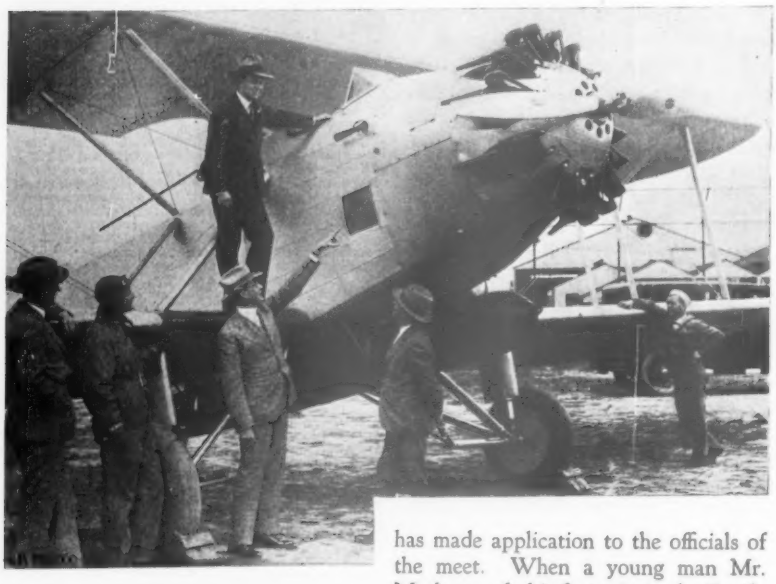
Theft Ring Operating

Of course, with the growth of aviation it was to be expected that sooner or later organized crime would be attracted to the aircraft field, but it caused something of a surprise in flying circles when it became known that department of justice agents have been working on a theory that an organized ring of aircraft thieves are conducting a methodical campaign of stealing, rebuilding and selling airplanes.

A year ago planes were stolen from Walter Anderson and C. L. Herchenberger of Richmond, Ind. Other planes have been missing from fields in Indiana and nearby states and it is believed by Federal operatives that the planes were flown to a place near Kansas City, where they were rebuilt completely and then flown to other points for sale. Identification of rebuilt planes is an extremely difficult matter.

Old Trail Blazer

Ezra Meeker, the 97-year-old western pioneer, wants to be a passenger in the New York-Spokane Air Derby which is to be held in September. He has made application to the officials of the meet. When a young man Mr. Meeker made his first trip to the Pacific Northwest by ox team. Since that time he has used nearly every other form of transportation. In 1921 he flew over the Oregon Trail in a plane, and at a later date flew across the United States with O. G. Kelly.



New Naval Bomber

For the first time in the history of government aviation an airplane has carried a greater load than the weight of the plane itself.

The new Martin naval bomber established a record when it went through preliminary tests at Cleveland, O. The plane was designed and built by Glenn L. Martin, of Cleveland, and may render obsolete all the existing bombers. The plane weighed 3,460 pounds and on its trial trip took aloft a load of 3,704 pounds. Part of the load is a one-ton bomb, which can be seen in the sling under the fuselage.

In spite of the fact that this plane is the largest single-engined, air-cooled aircraft of its kind, its weight is nearly a ton less than the bombing planes now in use.

The fighting craft has five cockpits, and mounts machine guns in two turrets. This makes it an effectual combat plane as well as a bombing plane.

In the photograph Glenn L. Martin, the maker of the plane, is shown pointing out some of its features to Edward P. Warner, who is the Assistant Secretary of the Navy, in charge of Navy Aviation.

U. S. Court in Plane

The first federal court ever to penetrate the Arctic circle arrived at Wiseman, Alaska, July 5, by airplane from Fairbanks, completing in three hours a journey that would have taken a month by dog team. District Judge Cecil H. Clegg, accompanied by the prosecuting attorney, United States marshal and the court stenographer, is carrying law on a whirlwind tour of 1,600 miles.

The aerial court was welcomed by the entire population of the Koyukuk district with dances of the Eskimo and the white man.

A greater curiosity than the flying justice were watermelons, cantaloupes and cherries, brought in the plane—luxuries never before seen in Wiseman.

Books on Aviation

Colonel H. A. Toulmin, Jr., has published "Air Service, American Expeditionary Force," which is the first comprehensive history of the American Air Service during the world war.

Colonel Toulmin suffers under no delusions as the way in which the announced air program of the United States was carried out. Much of his criticism is justified, but here and there are complaints of failure that are really not due to either lack of organization or personnel. For instance, rapid changes in the war front which made certain designs antiquated are really only chargeable to the fortunes of war.

The book contains many illustrations, and the charts are interesting to any one studying problems of organization. The introduction is by Jacques Louis Dumesnil.

"The Great Delusion" is the title of a book published anonymously by an Englishman calling himself "Neon." The allusion in his choice of a nom-de-plume is to the fog dispelling character of the Neon light.

The book is a rather gloomy prophecy for aircraft. If one is to take the writer's word for it man's conquest of the air has been for naught. But in his anxiety to make out a case against aircraft "Neon" resorts to such absurd statements as "at reconnaissance the airplane in the war was a total failure."

Probably the author is a dyed-in-the-wool navy man, who is in reality whistling up his courage as he sees planes becoming the eyes of the Navy. Although the book is a biased review of the history of aircraft, and is full of misstatements, either unintentional or mischevious, it does bring up questions that are worthy of thought and discussion.

Questions and Answers

Popular Aviation will endeavor to answer all questions of general interest pertaining to aviation in this department. If personal answers are required please send the Editor a stamped and addressed envelope.

Q.—What is the Wright motor? There seems to be a lot of discussion as to whether it is a navy motor or an English one. Please set me "wright" on this.—J. C. L., Cleveland, Ohio.

A.—There is a good deal of misinformation in the air about the Wright Whirlwind motor. If any one man is to be given credit for its development that many should be Charles L. Lawrance of the Wright Aeronautical Corporation. However, no single individual can be given credit for both design and complete development.

The original design of the Wright Whirlwind was drawn by Mr. Lawrance after five years of work with similar engines of much less capacity. In some respects it is a development along the lines of an English motor. Since the original design the improvements have consisted mainly of detail changes which have improved the reliability. Many engineers, notably S. D. Heron, who was with the army air corps as a research engineer, have aided in this development.

Q.—Why are flyers taught to stunt? Isn't straight flying sufficient?—C. M. M., Kansas City, Mo.

A.—Stunting, from a military or naval standpoint is necessary, as war conditions makes such flying essential. Combat flying requires the utmost efficiency in plane handling. That in itself should answer the question. Straight commercial flying requires no stunting in actual flight, but a pilot should be able to handle his plane under every possible flying condition. Only training in definite manouvers, which you call stunts, will give that necessary experience. If by stunts you mean circus work, that is done for amusement purposes and is no more representative of actual flying than the circus tight rope walker is representative of the pedestrian. If you mean some of the fool flying that is sometimes seen at flying fields, just ask any air man what he thinks of it.

Q: What physical qualifications are necessary for a flyer? M. L. S., Stoughton, Mass.

A.—Officers of the Illinois department of health are agreed that air pilots must be men in good health. They recently declared that "Flying requires a healthy heart. Modern airplanes climb to an altitude of 5,000 or 10,000 feet in five to ten minutes and come down with even greater speed. Such rapid changes from heavy to light air pressure areas and back again try the heart. It must be able to accommodate itself quickly to the sudden changes in air pressure, which make it easier or more difficult to pump the blood supply into the arteries. Without a correct blood supply to all parts of the body at all times a pilot will not be able to exercise the best use of his muscles and his mind. Things happen with such excessive speed in the air that a single false move may prove disastrous.

"Army airplane pilots are practically all of the Lindbergh type—tall, well built but not fat. Too much fat is a burden on the heart. This, added to the strain brought on by frequent and sudden changes in atmospheric pressure, eliminates the fat folks from the flying game.

"Perfect vision is another requirement of candidates who would become pilots. Nearly a score of different tests are given in order that the flight surgeon may be satisfied that no defect is present. In the air the pilot must be able to scan the skies for other aircraft, which appear to be very small when only a few miles away. He must be able to judge distances between his own and other planes accurately. He must be able to judge distances between his machine and the ground, trees, houses and other objects.

"He must be able to detect wind directions by whiffs of smoke or dust, by the action of windmills and similar things. All of this makes perfect vision a necessary requirement for safe airplane driving."

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BUT WHO ARE THESE PEOPLE?

Manufacturers say that they sell planes (outside of the regular business of selling planes to transport companies and the government) to people all over the United States. But they cannot tell who these people are, what they do, what they want these planes for, or anything about them. In other words the market is as yet undefined.

WON'T YOU HELP THE INDUSTRY?

Help us to define this great market which is now assuming proportions that threaten to swamp the facilities of the aircraft and accessory manufacturers of the country. If you are interested in aviation; if you plan on making it your profession; if you want to fly an airplane, either for the sport of it or because you need it in your business;—tell us; let us know who you are, so that we can make a cross section of the popular demand for aircraft and the interest in flying.

Fill out this questionnaire and send it to us. We do not intend to turn your name over to any manufacturer, except at your request, but the information will be of the greatest possible value to the industry in its effort to advance and render service to the public interested in Fast, Clean and Safe Air Transportation.

Name..... Address.....

City..... State..... Business.....

Position..... Age..... Sex.....

Can You Fly?..... Do You Want to Learn?..... Do You Use Air Mail?.....

Do You Use Air Passenger Service?..... Air Express?.....

Do You Plan Buying a Plane?..... When?..... What For?.....

..... What Kind?..... Power?.....

Seating How Many?..... Is There an Available Field Near You?..... How Large?.....

Privately Owned?..... Public Field?..... Is One Projected?.....

By Whom?..... Does Flying Interest You As a Career?.....

In What Capacity?..... Why?.....

Have You Friends Who Fly?..... Pleasure or Commercial?.....

What Do You Read on Aviation?.....

.....

What Would You Like to Read Along Aviation Lines in Popular Aviation? Stories?.....

Technical Articles?..... History?..... Current News?..... Air Port News?.....

Science?..... Model Building?..... Gliders?.....

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Ten Year Old Flyer

Even the girls of the younger generation are taking to the air. 'cky Heath has flown over 300 hours. She is the daughter of E. B. Heath, one of the pioneer flyers and airplane manufacturers of Chicago. She is

shown with one of the tiny "Parasol Sport Planes," one of the latest Heath productions. This little plane has a wing spread of only 21 feet but it will step along at about seventy miles per hour.

Try for Record

It is understood that Clarence Chamberlin, Bert Acosta and Bernt Balchen will try for a new endurance record within a short time. The present record, held by Chamberlin and Acosta of 51 hours 11 minutes and 25 seconds, was established in the Bellanca "Columbia." It is the belief of the flyers that by eliminating the instruments carried by the Columbia at least fifty gallons more gasoline can be carried which should better the present record by more than five hours, and possibly enable them to keep aloft for sixty hours.

Light Plane Record

Two women aviators, Lady Bailey, wife of the South African millionaire, Sir Abe Bailey, and Mrs. Geoffrey de Haviland, wife of the designer of the famous war fighting planes, reached a height of 18,000 feet in a Moth plane on July 5. This is claimed to be the altitude record for light planes.

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E. B. Heath, in 1909 ready to establish a record

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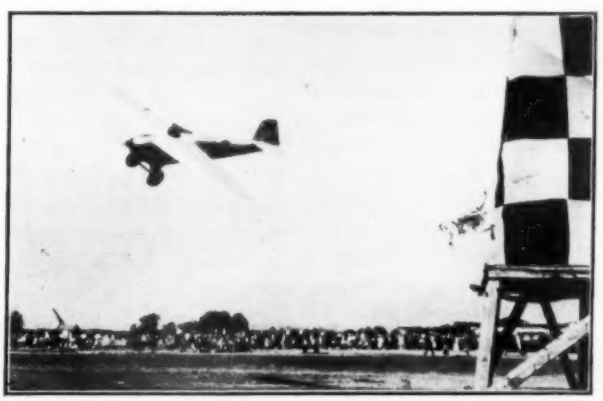

E. B. Heath leaving all behind in the final dash at the National Air Races

The Vanishing Gypsy

(*Continued from page 30*)

when there was any work to do about a ship. A truck took both wings over to the beach and Probst, my mechanic, went over with the fuselage in a small Ford truck.

"The members of the flying circus were discussing newer and better ways to commit suicide than in doing it from a burning plane, and giving me the benefit of their cheering comment, when Probst came to tell me that a big truck had run into the tail surfaces of the Jenny and it wouldn't be in shape to fly the next day.

"There was no material in town to repair the tail surfaces, and Scotty and I began to figure that the main drawing card of the show was off. But the head of the flying circus came to our rescue and sold me the surfaces of a Jenny that he was rebuilding at Orlando. It was only sixty miles away and in ten minutes we had a mechanic on his way to get them. We worked all night on the old crate and at dawn she was ready to fly.

"People came to Cocoa from Jacksonville and Miami—as they said, 'to see a fool commit suicide.' At the last minute the small back-pack parachute that I had wired for failed to arrive and I had to plan on using a cambric exhibition chute. A back-pack chute is made of silk and folds into a small pack which fits your back. With one of them you can jump clear of the ship and pull the chute open when you are clear of the plane.

"The exhibition chute is a big affair and about the last thing to use for a jump of the kind I was to make. It was too big and bulky and there were too many chances of fouling.

"The plane had been fixed so that it could be set on fire by throwing a switch. The electricians had run four sets of wires, one to each wing tip, and each connected with a spark plug that was packed in a small cloth bag filled with powder. A switch to throw the juice of an auto battery, and a small Ford coil completed the apparatus.

"The plane was saturated with twenty-five gallons of gasoline and ten gallons of crude oil had been poured over the wings. Cocoa Beach was packed with people and I had to make the start. The parachute was tied to me with a rope and was so bulky that I could hardly move. I was helped into the cockpit and gave the Jenny the gun.

"All went well until I had climbed about 1,200 feet. Then the old engine started missing badly. I looked at the beach to see if there was a place for men to land and remedy the trouble, but it was packed with people. There was only one thing to do so I started for the ocean. A half-mile off shore the motor cut completely.

"I had planned to climb to about 3,000 feet and when I was a mile off shore to touch off the plane. Then, when it was burning good, to stand up in the seat and shove the stick forward with my foot. This would throw the old crate into a nose dive and would toss me, with my chute, clear.

"Well figured, but it simply didn't happen. I was going to stand up in the seat when the chute got all tangled up in the controls. Here the darn thing was burning all around me and I was tied to it. I got out on the step and hung on with one hand and worked at untangling the ropes with the other. The plane stalled and then went into a dive just as I got free.

"It was a race for a minute, no, a year or two, between the blazing ship and myself. Then the chute opened and I made a nice landing in the water. There weren't any hungry sharks about at the time and a boat crew soon picked me up.

"The thrills were over for me, but not for the crowd, because the Jenny came out of her nose dive when she was about three hundred feet from the ocean and, upside down, started to glide toward the crowd on the beach. It looked for a minute as if the crowd was due for a few escapes from a burning ship, but Jenny changed her mind and went to bed in the water not far from the shore."

There is the gypsy flyer—in his own words. Ingenious; working all night on a cracked-up ship so as to be able to keep his engagement; secure in his knowledge of his own ability and resourcefulness; taking chances, some of them desperate; all in order to stay in a business that he loved.

These are the men who kept aviation before the public in the days before the air mail became well known, when regular passenger traffic in cabin planes running on schedule was unknown. They are the link between the old days and the new.

National Playground Miniature Aircraft Tournament

(*Continued from page 35*)

tions of contestants in accordance with the above rules. Information as to methods of registering competitors, trial flights, previous inspection of planes, methods of running off and judging the events, will later be sent to the local committee.

It is suggested, too, that the local interest in these events will be greatly enhanced if events other than those to be decided in the finals at Memphis be added to the local program. In the nature of the case, the National Committee cannot, because of the impossibility of personal inspection, make decision as to originality of design, beauty of construction, "aerobatics," *i. e.*, the stunt possibilities of the aircraft. The National Committee will, however, make suggestions along these lines to the local committees and urge local committees to include events and competitions of these kinds in their local program.

It is suggested to local committees that interest and participation can be greatly increased in the communities if the newspapers, especially, and also the local civic clubs and any clubs interested in aviation, be asked to help and co-operate in the local tournaments.

Join Air Service

Army officers have been urged by the War Department to apply for transfer to the air corps because of "the promising future of aviation in general and of the army air corps in particular." The expansion of the air corps will increase its commissioned personnel to 1,650, and the department is making a special effort to get from other branches of the army men qualified to fill some of the vacancies after having been trained to fly.

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